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B.Tech - Computer Science and Engineering
R-22
I Year

ENGLISH FOR SKILL ENHANCEMENT (D1HSE1)

Course Outcomes:
Students will be able to:
1. Understand the importance of vocabulary and sentence structures.
2. Choose appropriate vocabulary and sentence structures for their oral and written communication.
3. Demonstrate their understanding of the rules of functional grammar.
4. Develop comprehension skills from the known and unknown passages.
5. Take an active part in drafting paragraphs, letters, essays, abstracts, précis and reports invarious contexts.
6. Acquire basic proficiency in reading and writing modules of English.

LINEAR ALGEBRA AND ORDINARY DIFFERENTIAL EQUATIONS (D1BSM1)

Course Outcomes:
After learning the contents of this paper the student must be able to
1. Discuss the matrix representation of a set of linear equations and to analyses the solution of thesystem of equations.
2. Reduce the quadratic form to canonical form using orthogonal transformation.
3. Identify whether the given DE of first order is exact or not.
4. Can find applications of first order ODE.
5. Solve higher differential equation and apply the concept of differential equation to real worldproblems.
6. Evaluating double integrals and applying them to compute the areas of regions.

ENGINEERING CHEMISTRY (D1BSEC1)

Course Outcomes:
1. Students will acquire the basic knowledge of conductance in Metals and Bond Structures.
2. The students are able to understand the basic properties of water and its usage in domestic and industrial purposes.
3. They will acquire the Knowledge of chemistry in Batteries.
4. They can learn the fundamentals and general properties of polymers and other engineering materials.
5. They can predict potential applications of chemistry and practical utility in order to become good engineers and entrepreneurs.

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C PROGRAMMING FOR PROBLEM SOLVING (D1ESCP1)

Course Outcomes:

After learning the contents of this course, the student must be able to

1. Learn the taxonomy of computers and C fundamentals
2. Demonstrate arrays and functions to write c programming
3. Write C programs using pointers and strings
4. Analyze and write C programs using structures and unions
5. Develop C programs for various applications using file I/O functions.

IT WORKSHOP AND ELEMENTS OF COMPUTER ENGINEERING (D1ESITW1)

Course Outcomes:

After learning the contents of this course, the student will be able to

1. Apply knowledge for computer assembling and software installation.
2. Solve the trouble shooting problems.
3. Apply the tools for preparation of PPT, Documentation and budget sheet
4. Create standard documents and research documents using Latex.
5. Create project plans.

COMPUTER AIDED ENGINEERING GRAPHICS (D1ESCEG)

Course Outcomes:

At the end of the course, the student will be able to:

1. Apply computer aided drafting tools to create 2D and 3D objects
2. Sketch conics and different types of solids
3. Appreciate the need of Sectional views of solids and Development of surfaces of solids
4. Read and interpret engineering drawings
5. Conversion of orthographic projection into isometric view and vice versa manually and byusing computer aided drafting

ENGLISH LANGUAGE AND COMMUNICATION SKILLS LAB (D1HSE2)

Course Outcomes
Students will be able to:

1. Understand the nuances of English language through audio- visual experience and groupactivities.
2. Neutralise their accent for intelligibility
3. Speak with clarity and confidence which in turn enhances their employability skills

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ENGINEERING CHEMISTRY LAB (D1BSEC2)

Course Outcomes

The experiments will make the student gain skills on:

1. The concepts of error and its analysis and can also develop the skills to tabulate the experimental data and derive valid conclusions.
2. Hands on experience in performing the electro-analytical techniques such as conductometry, potentiometry and pH metry.
3. The ability to prepare polymers.
4. Estimation of Surface tension and viscosity of Lubricant oil.

C PROGRAMMING FOR PROBLEM (D1ESCP3)

Course Outcomes

After learning the contents of this course, the student will be able to

1. Design and test programs to solve mathematical and scientific problems.
2. Write structured programs using control structures and functions.

BUSINESS ECONOMICS AND FINANCIAL ANALYSIS (D2HSBF)

Course Outcomes

1. Analyze the total structure of the business and able to identify and classify the different types of business entities.
2. Asses the demand and supply analyses with the help of various measures and types of Elasticity of demand.
3. Infer the knowledge about production and cost analysis for product and services.
4. Interpret the fundamental concepts related to financial accounting.
5. Predict the financial position by analyzing the financial statement of the company through various ratios.

STATISTICAL METHODS AND VECTOR CALCULUS (D2BSM5)

Course Outcomes:

After learning the contents of this course the student will be able to

1. Apply Statistical logic for solving the problems.
2. Analyse the qualitative & quantitative data.
3. Analyse the time series for the given data
4. Explain and compute derivatives of vector valued functions, gradient functions
5. Evaluate the line- surface and volume integrals and converting them from one to another.

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APPLIED PHYSICS (D2HSBF)

COURSE OUTCOMES:

After completion of student would able to

1. Summarize the fundamentals of quantum mechanics to understand the quantum physics in the physical world,
2. By understand the fundamentals of band theory of solids; students will be able to classify the materials on the basis of energy gap.
3. Knowing the physics behind the semiconductors, enables the students to use them in different engineering applications
4. Establishing a strong foundation on the different kinds of opto-electronic, dielectric and display materials and paves a way for them to use in at various technical and engineering applications
5. Knowledge on fiber optics and quantum information enables the students to apply them in systems like optical communications and advanced quantum communication.

BASIC ELECTRICAL ENGINEERING (D2ESBEE)

Course Outcomes:

After this course, the student will be able to

1. Understand and analyze DC, AC circuits using basic principles.
2. Analyze and evaluate electrical circuits using various theorems.
3. Understand the characteristics and performance of Electrical Machines and Transformers.
4. Understand the applications of various electrical installations.

DATA STRUCTURES (D2ESDS)

Course Outcomes:

After learning the contents of this course, the student will be able to

1. Analyze time and space complexity of various problems and distinguish various data structures.L4
2. Demonstrate various Abstract Data Types.
3. Analyze the Binary tree and Disjoint set ADT
4. Analyze and implement various kinds of searching and sorting techniques
5. Design programs using a variety of data structures such as graphs and search trees

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APPLIED PHYSICS LAB (D2BSAP2)

Course Outcomes:

1. Identify the V-I characteristics of Laser diode.
2. Evaluate the numerical and bending loss of given optical fiber.
3. Analyze the V-I characteristics of LED and photodiode devices.
4. Identify the type of semiconductor by using Hall Effect experiment.
5. Calculate the Plank's constant using Photocell.

BASIC ELECTRICAL AND SIMULATION LAB (D2ESBES)

Course Outcomes:

After the completion of this laboratory course, the student will be able to

1. Apply various laws to solve electrical networks.
2. Apply network theorems to solve complex electrical networks.
3. Evaluate the performance of different types of Electrical machines and single phasetransformer by conducting various tests
4. Understand and analyze electrical installations using different lamp controlled methods, staircase wiring and different wiring connection

DATA STRUCTURS LAB (D2ESDSL)

Course Outcomes:

1. After learning the contents of this course, the student will be able to
2. Identify the appropriate data structures and algorithms for solving real world problems.
3. Apply various searching and sorting techniques for solving the given problems
4. Apply various data structures such as stacks, queues, search trees, and hash tables to solve the computing problems.
5. Implement different disjoint set operations and k-d trees.

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B.TECH – COMPUTER SCIENCE & ENGINEERING
R-20
II Year

BUSINESS ECONOMICS AND FINANCIAL ANALYSIS (CHSM1)

Course Outcomes:

1. Analyze the total structure of the business & able to identify and classify the different types of business entities.
2. Asses the demand & supply analyses with the help of various measures and types of Elasticity of demand.
3. Infer the knowledge about production and cost analysis for product and services.
4. Interpret the fundamental concepts related to financial accounting.
5. Predict the financial position by analyzing the financial statement of the company through various ratios.

MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE (CBSM4)

Course Outcomes:

After learning the contents of this course, the student must be able to
1. Apply mathematical logic to solve problems.
2. Analyse the assertions using predicate logic.
3. Analyse different properties of GCD.
4. Find the GCD using Division and Euclidean Algorithm.
5. Illustrate the basic terminology of functions, relations, sets and demonstrate knowledge of their associated operations.
6. Understand the importance of algebraic properties with regard to working within various number systems.

LOGIC CIRCUITS DESIGN (CESLC1)

Course Outcomes:

After learning the contents of this course, the student will be able to
1. Understand the various number systems and logic gates.
2. Solve Boolean expressions using minimization methods and design the sequential and combinational circuits.
3. Analyze flip flops, Registers and counters.
4. Demonstrate register transfer language and micro-operations
5. Demonstrate memory, RAM, ROM and Programmable Logic Array

DATABASE MANAGEMENT SYSTEMS (C53PC1)

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DATABASE MANAGEMENT SYSTEMS (C53PC1)

Course Outcomes:

After learning the contents of this course, the student will be able to

1. Demonstrate the basic elements of a relational database management system and identify the data models for relevant problems.

2. Design entity relationship model and convert entity relationship diagrams into RDBMS

3. Formulate SQL queries for the given data base and apply the normalization techniques to the development of application software

4. Analyze the transaction management and concurrency control

5. Compare and contrast indexing and Hash based indexing

DATA STRUCTURES (C53PC2)

Course Outcomes:

After learning the contents of this course, the student will be able to

1. Analyze time and space complexity of various problems and distinguish various data structures.

2. Demonstrate various Abstract Data Types.

3. Analyze the Binary tree and Disjoint set ADT

4. Analyze and implement various kinds of searching and sorting techniques

5. Design programs using a variety of data structures such as graphs and search trees

OPERATING SYSTEMS (C53PC3)

Course Outcomes:

After learning the contents of this course, the student will be able to

1. Demonstrate OS structure, design and implementation.

2. Analyze process scheduling and synchronization .

3. Apply various mechanisms to detect and recovery the deadlocks and demonstrate various memory management strategies.

4. Illustrate virtual memory management and storage file management system.

5. Analyze file system implementation

LOGIC CIRCUITS DESIGN LAB (CESLC2)

Course Outcomes:

After learning the contents of this course, the student will be able to

1. Apply the fundamentals of digital logic gates to design combinational and sequential circuits.

2. Analyze and interpret the results obtained for logic gates and various combinational and sequential circuits.

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DATABASE MANAGEMENT SYSTEMS LAB (C53PC4)

Course Outcomes:
After learning the contents of this course, the student will be able to
1. Design and implement a database schema for a given problem.
2. Apply the normalization techniques for development of application software to realistic problems.
3. Formulate queries using SQL DML/DDL/DCL commands.
4. Develop application programs using PL/SQL

DATA STRUCTURES LAB (C53PC5)

Course Outcomes:
After learning the contents of this course, the student will be able to
1. Identify the appropriate data structures and algorithms for solving real world problems.
2. Apply various searching and sorting techniques for solving the given problems
3. Apply various data structures such as stacks, queues, search trees, and hash tables to solve the computing problems.
4. Implement different disjoint set operations and k-d trees.

PROBABILITY & STATISTICS (CBSM3)

Course Outcomes:
After learning the contents of this course, the student must be able to learn the concept of
1. Random variables and various discrete and continuous probability distributions and their properties.
2. Calculate interval estimations of Mean and Proportion of large samples.
3. Make important decisions for few samples which are taken from a large data.
4. Calculate Mean and Proportion and to make important decisions from large samples which are taken from normal populations.
5. Test the hypothesis and give the inference to the given data.
6. The statistical methods of studying data sample.

COMPUTER ORGANIZATION AND ARCHITECTURE (C54PC1)
Course Outcomes:
After learning the contents of this course, the student will be able to
1. Understand the basic computer organization and design
2. Design the hardwired and micro-programmed control units and demonstrate 8086 architecture
3. Analyze the computer arithmetic operations and write 8086 basic ALP programs
4. Analyze I/O data transfer modes and memory hierarchy.
5. Analyze the concurrent processing

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SOFTWARE ENGINEERING (C54PC2)

Course Outcomes:
After learning the contents of this course, the student will be able to
1. Apply different process models for software engineering
2. Recognize the minimum requirements and system models for the development of applications
3. Demonstrate design models
4. Apply the process of validation and verification for a developed application(Prototype)
5. Analyze risks strategies associated with software development

DESIGN AND ANALYSIS OF ALGORITHMS (C54PC3)

Course Outcomes:
After learning the contents of this course, the student will be able to
1. Apply mathematical analysis methods to analyze the performance of algorithms and applydivide and conquer technique to solve the computing problems.
2. Demonstrate disjoint set operations and apply back tracking technique to solve the computing problems.
3. Apply Greedy method to solve various computing problems. –
4. Synthesize efficient algorithms in common engineering design situations using dynamic programming technique.
5. Solve complex problems using branch and bound technique and analyze NP hard and NP complete problems -

FORMAL LANGUAGES & AUTOMATA THEORY (C54PC4)

Course Outcomes:
After learning the contents of this course, the student will be able to
1. Understand the concept of abstract machines and build up the ability to recognize the formal languages.
2. Employ finite state machines for modeling and solving computing problems.
3. Design context free grammars for formal languages.
4. Normalizing the context Free Grammar and design Turing Machines.
5. Demonstrate decidability, intractable problems and NP complete problems.

OBJECT ORIENTED PROGRAMMING THROUGH JAVA (C54PC5)

Course Outcomes:
After learning the contents of this course, the student will be able to
1. Demonstrate the concepts of object oriented programming
2. Develop programs using java packages, interfaces and stream based I/O.
3. Analyze Handling of errors and concurrency using JAVA.
4. Analyze the collection frameworks
5. Develop applets for web applications and GUI based applications

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OBJECT ORIENTED PROGRAMMING THROUGH JAVA LAB (C54PC6)

Course Outcomes:

After completion of course, the student will be able to

1. Write programs for problems, using java collection frame work and abstract classes
2. Design and develop programs using objects and inheritance in Java language.
3. Write multithreaded programs.

COMPUTER ORGANIZATION & ARCHITECTURE LAB (C54PC7)

Course Outcomes:

After learning the contents of this course, the student will be able to

1. Design algorithm and develop the assembly language program for different problems using 8086 Assembly Language Programming.

DESIGN AND ANALYSIS OF ALGORITHMS LAB (C54PC8)

Course Outcomes:

After learning the contents of this course, the student must be able to

1. Analyze the asymptotic performance of algorithms.
2. Write rigorous correctness proofs for algorithms.
3. Demonstrate a familiarity with major algorithms and data structures.
4. Apply important algorithmic design paradigms and methods of analysis.
5. Synthesize efficient algorithms in common engineering design situations.

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B.Tech - Computer Science and Engineering
R-20
III Year

OBJECT ORIENTED ANALYSIS AND DESIGN -C55PC1

Course Outcomes:
Upon completion of the Course, the student will be able to

1. Understand the significance of unified modelling language by studying the necessity of unified modelling language
2. Construct basic structural modelling, using class and object diagrams
3. Develop uses cases, and activities for applications
4. Design state chart diagram, based on state machines, use components to deploy and build architectural models
5. Implement unified library applications, develop patterns and framework

PYTHON PROGRAMMING - C55PC2

Course Outcomes:
After completion of course the student will be able to

1. Understand the basic concepts of python programming
2. Illustrate operators, conditional statements, loops in python
3. Construct code and test small python programs using functions and data structures
4. Develop different programs using file concept modules of python – L5
5. Apply the concepts of object – oriented programming in python

COMPUTER NETWORKS (C55PC3)

Course Outcomes:
Upon completion of the course the student will be able to

1. Understand the protocol layering and physical level communication
2. Analyze Data link layer and MAC layer
3. Compare and contrast between the functions of the network layer and the various routing protocols
4. Demonstrate the functions and protocols of the Transport layer
5. Illustrate the functions and protocols of the Application layer

COMPILER DESIGN (C55PC4)

Course Outcomes:
Upon completion of the course, the student will be able to

1. Understand different phases of a compiler
2. Design different parsers
3. Demonstrate syntax-directed translation schemes and generate intermediate code
4. Analyze code optimization techniques, and runtime environment
5. Design machine independent code optimization techniques

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DISTRIBUTED DATABASES (C55PE5A)

Course Outcomes:

Upon completion of the Course, the student will be able to

1. Identify the necessity of distributed Database concepts, through architecture and design
2. Understand processing queries, decompose, and to optimize queries
3. Practice the control mechanisms and algorithms that are implied through transaction management
4. Discover i s s u e s like reliability, parallelism, associated in developing distributed database system
5. Understand and relate the concepts of Object Oriented design paradigm to Distributed Databases

DISTRIBUTED COMPUTING (C55PE5B)

Course Outcomes:
Upon completion of the course, the student will be able to

1. Understand knowledge on distributed system and computing paradigms
2. Apply the inter process communication concepts to develop socket APIs
3. Develop client server paradigms and imply to build group communication
4. Illustrate the phenomenon of distributed objects, internet applications
5. Understand the basics of grid computing

NETWORK PROTOCOLS (C55PE5C)

Course Outcomes:
Upon completion of the course, the students will be able to:

1. Compare & contrast the different network architectures and protocols
2. Design different TCP/IP protocols
3. Understand various network security technologies and protocols
4. Understand WAN protocols
5. Analyze various LAN protocols

INFORMATION THEORY AND CODING (C55PE5D)

Course Outcomes:
Upon completion of the course, the student will
1. Understand the concept of information and entropy
2. Demonstrate the properties of codes and understand Shannon 's theorem for coding
3. Compute channel capacity and apply mechanism for sharing mutual information
4. Compare the finite geometric codes
5. Understand application of Convolutional Codes

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SOFTWARE PROCESS AND PROJECT MANAGEMENT (C55PE5E)

Course Outcomes:

Upon completion of the course, the student will be able to

1. Understand conventional software management and improving software economics
2. Analyze principles of modern software management and improving software economics
3. Demonstrate life cycle phases and model based software architectures
4. Analyze work flows of the process and Line- of- Business organization
5. Develop future software project management , project control ,process instrumentation and various case studies

ARTIFICIAL INTELLIGENCE (C55PE5F)

Course Outcomes:

Upon completion of the course, the student will be able to

1. Gain knowledge on AI phenomenon, use state space representations and apply heuristic techniques
2. Apply knowledge representation issues to build predicate logic and knowledge rules
3. Understand the uncertainty measures for symbolic reasoning and infer knowledge in statistical reasoning
4. Compare and contrast among weak and strong slots filter structures.
5. Analyze the game playing techniques of AI, plan and build a system

EMBEDDED SYSTEMS DESIGN (C055OE6)

COURSE OUTCOMES:

1. Understands the basic concepts of Embedded Systems
2. Formulates typical Embedded System
3. Illustrates the trends in Embedded Industry
4. Outlines the concepts of RTOS based Embedded System Design
5. Analyze Task Communication in RTOS

OBJECT-ORIENTED ANALYSIS AND DESIGN LAB (C55PC7)

Course Outcomes:

1. Design and implement projects using OO concepts
2. Use the UML analysis and design diagrams
3. Apply appropriate design patterns
4. Create code from design
5. Compare and contrast various testing techniques

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PYTHON PROGRAMMING LAB (C55PC8)

Course Outcomes:
After completion of course the student will be able to
1. Use fundamental programming elements : operators ,statements, conditional andcontrol flow statements
2. Compare & contrast predefined functions and build functions
3. Solve various computing problems using python modules and data structures
4. Apply oops concepts using python

DATA WAREHOUSING AND DATA MINING (C56PC1)

Course Outcomes:
Upon completion of the Course, the student will be able to

1. Understand insights on the necessity of building a data Warehouse, and basic operations that canbe performed on it
2. Understand the basics data mining ,challenges and functionalities
3. Analyze the algorithms developed for understanding Association rule functionality
4. Compare and contrast various classification algorithms
5. Analyze grouping of similar knowledge based on the information, and study different approaches proposed for grouping the information

WEB TECHNOLOGIES (C56PC2)

Course Outcomes:
Upon completion of the course, the student will
1. Understand basics of server side scripting using PHP
2. Illustrate well formed XML programs and how to parse, use XML data with JAVA – L3
3. Design server side programming applications with servlets
4. Develop programs using JSP for various applications
5. Write programs with knowledge of client side scripting , validation of forms and AJAX programs

ADVANCED DATABASES (C56PE3A)

Course Outcomes:
Upon completion of the course, the student will

1. Understand the database system architecture and concepts of parallel databases

2. Illustrate Object databases, and XML databases

3. Compare & contrast the significance and concepts of Information retrieval, apply them in implementingtransaction management features

4. Understand t h e concepts of advance transaction processing, advance application development,spatial and temporal data Mobility

5. Understand the address the prelims of security issues over advance database concepts

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MOBILE COMPUTING (C56PE3B)

Course Outcomes:

Upon completion of the course, the student will

1. Understand mobile communications and limitations of mobile devices
2. Illustrate the architecture of GSM protocol and MAC layer
3. Compare and contrast various mobile IP network layer and mobile transport layer
4. Demonstrate database hoarding techniques and data dissemination for broadcasting
5. Compare & contrast the ad hoc networks and related concepts.

WIRELESS NETWORKS (C56PE3C)

Course Outcomes:

On successful completion of the course the students will be able to

1. Understand the various issues and applications of Ad hoc wireless networks
2. Understand the working of MAC protocols for Ad-hoc wireless networks
3. Compare and contrast the working of various On-Demand Routing protocols
4. Analyze the challenges in designing Transport layer Protocols for Ad-hoc networks,
Compare and contrast the working of Transport protocols
5. Design the issues in designing Security Protocols for Ad-hoc networks focusing on the
working performance of various security protocols

CRYPTOGRAPHY (C56PE3D)

Course Outcomes:

Upon completion of the Course, the student will be able to

1. Understand how to encrypt the information using classical techniques like, symmetry,
substitution, and steganography
2. Apply techniques to generate pseudo random sequences, use stream ciphers to for encrypting
and decrypting the data
3. Understand about Number theory, a mathematical notation of representing information
4. Illustrate the principles of public key crypto systems to encrypt and decrypt the information
5. Understand various algorithms developed for hassing functions; choose one way hashing
functions like, Message Authentication codes, Digital Signal Algorithm, Discrete Logarithm
Signature

SOFTWARE REQUIREMENTS ESTIMATION (C56PE3E)

Course Outcomes:

Upon completion of the Course, the student will

1. Understand the requirements are, necessary to build a software using good
practices of engineering
2. Analyze the developed models for a software
3. Illustrate make estimations, across modules of a software
4. Apply cost estimations based on schedule and effort for developing efficient
software modules.
5. Design various tools that exist for software estimation- L5.

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MACHINE LEARNING (C56PE3F)

Course Outcomes:
Upon completion of the Course, the student will

1. Design a learning system based on well-posed problems, study perspectives issues in machine learning-L5

2. Understand the basic phenomenon of artificial neural networks and infer the evaluation hypothesis mechanism for learning mechanism.

3. Apply bayes theory, computational theory, and instance base on learning mechanism. Classify the learnt information based on hypothesis for predicting probabilities

4. Apply set of rules and analyze the learning mechanism with perfect domain theories like PROLOG-EGB   .

5. Compare and contrast combine inductive and Analytical learning approaches

INTRODUCTION TO ANALYTICS (C56PE4A)

Course Outcomes:
On completion of course the student will be able to

1. Use the concepts of Big Data, Data Science and Descriptive Statistics. – L3

2. Analyze descriptive multivariate analysis and various preprocessing techniques.

3. Apply different clustering and regression methods.

4. Apply additional predictive methods and classifications techniques on different data sets.

5. Demonstrate various text, web and social media applications.

CLOUD COMPUTING (C56PE4B)

Course Outcomes:
Upon completion of the course, the student will

1. Understand the basic concepts of cloud computing and process of migrating into a cloud

2. Understand the paradigm for the cloud era using integration as a service, and the phenomenon of enterprise cloud computing paradigm.

3. understand the concepts of, infrastructure as a service (IAAS), Platform and software as a service

4. Compare &contrast to manage, monitor, and apply a cloud, using governance.

5. Develop different cloud services

MOBILE ADHOC NETWORKS (C56PE4C)

Course Outcomes:
Upon completion of the course, the student will

1. Analyze the applications of Mobile Adhoc Networks

2. Illustrate addressing the design issues of MAC protocols

3. Prepare insights on the challenges of transmission control protocols and its performance overother protocols.

4. Apply different protocols to develop energy management system

5. Create optimize and integrate cross layer design issues .

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NETWORK SECURITY (C56PE4D)

Course Outcomes:

Upon completion of course, the student will be able to

1. Apply security mechanisms across transport layer

2. Understand and learn the security mechanism involved across a wireless network

3. Understand about types of intruders and respective detection mechanism, malicious software, and viruses.

4. Illustrate the need and significance of firewall and its types .

5. Understand and gain knowledge on basic concepts of Network Management System, legal and ethical aspects of establishing a network.

DESIGN PATTERNS (C56PE4E)

Course Outcomes:

Upon completion of course, the student will be able to

1. Understand scalable and easily maintainable software designs.

2. Design an interface for documenting the built software modules.

3. Compare and contrast decompose the structure of a designed software into classes and objects

4. Identify communication among the objects occurs.

5. Create a behavioral pattern for an organization.-L5

DEEP LEARNING (C56PE4F)

Course Outcomes:

Upon completion of the course, the student will be able to

1. Understand the concepts of deep feed forward networks, regularization for Deep Learning taxonomy

2. Apply the knowledge to optimize training deep models, understand the motivation, and mechanism to build convolutional networks.

3. Develop sequence modelling using the knowledge of recurrent and recursive networks.-L5

4. Analyze various auto encoders, gain overview of representation learning

5. Apply different structured probabilistic models for deep learning.

DATA WAREHOUSING AND DATA MINING LAB (C56PC5)

Course Outcomes:

Upon completion of course, the student will be able to

1. Build a data warehouse and query it (using open source tools like PentahoData Integration and Pentaho Business Analytics)

2. Understand data mining tasks using a data mining toolkit (such as open-source WEKA)

3. Understand the data sets and data preprocessing

4. Demonstrate the working of algorithms for data mining tasks such association rule mining, classification, clustering, and regression

5. Practice the data mining techniques with varied input values for different parameters.

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WEB TECHNOLOGIES LAB (C56PC6)

Course Outcomes:

After completion of this course, the student will be able to

1. Solve LAMP Stack for web applications
2. Develop servlets and JSPs applications using tomcat server
3. Practice simple applications with Technologies like HTML, Javascript, AJAX, PHP, Servlets,and JSPs, Parse XML files using Java (DOM and SAX parsers)
4. Create to Database and get results

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B.TECH. COMPUTER SCIENCE & ENGINEERING
IV YEAR R18

Big Data Analytics - B57PE1

COURSE OUTCOMES:
After completion of this course, students will be able to
1. Analyze data management in various sources.
2. Use the big data tools for decision making.
3. Compute descriptive statistics to understand the nature of the data.
4. Design Machine Learning Algorithms for prediction.
5. Use appropriate tools for data visualization.

NETWORK SECURITY (B57PE1)-R18

COURSE OUTCOMES:
After completion of course the student will be able to
1. Analyze various security mechanisms in transport layer security.
2. Compare and contrast security mechanisms in wireless network security.
3. Analyze different types of intruders, malicious softwares, viruses.
4. Analyze various types of firewalls.
5. Learn network management security, legal and ethical aspects.

MOBILE COMPUTING - B57PE1

COURSE OUTCOMES:
After completion of course the student will be able to

1. Understand mobile computing and analyze various MAC protocols

2. Illustrate the taxonomy of telecommunication systems in wireless networks.

3. Analyze various protocols in mobile network layer.

4. Illustrate various protocols related to mobile transport and application layer.

5. Develop a mobile application using android/blackberry/iOS/Windows SDK.

WEB SERVICES -B57PE2

COURSE OUTCOMES:
After completion of course the student will be able to
1. Learn evolution and emergence of web services.
2. Explain about the Fundamentals of SOAP.
3. Generalize web service life cycle.
4. Analyze various discovery mechanisms and limitation of UDDI.
5. Create a Java client for Web service interoperability.

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CLOUD COMPUTING -B57PE2

COURSE OUTCOMES:

After completion of course the student will be able to

1. Articulate the main concepts, key technologies, strengths, and limitations of cloud computing andthepossible applications for state-of-the-art cloud computing.

2. Identify the architecture and infrastructure of cloud computing, including SaaS, PaaS, IaaS, publiccloud,private cloud, hybrid cloud, etc.

3. Explain the core issues of cloud computing such as security, privacy, and interoperability.

4. Provide the appropriate cloud computing solutions and recommendations according to the applications used.

5. Analyze various access control mechanisms in cloud.

COMPUTER GRAPHICS -B57PE2

COURSE OUTCOMES:

After completion of course, students will be able to

1. Understand fundamentals of computer graphics and various output primitives.

2. Demonstrate the concepts of 2D Geometrical transforms and viewing.

3. Compare Hermite curve, Bezier curve and B-spline curves.

4. Analyze surface detection and Surface rendering Methods.

5. Design animation sequence.

MACHINE LEARNING -B57PE4

COURSE OUTCOMES:

After completion of course the student will be able to

1. Illustrate the concepts of concept learning.
2. Apply decision trees learning, artificial neural networks and evaluation hypotheses for themachine learning problems.
3. Develop Bayesian and support vector classifiers by removing irregular features and avoidingoverfitting.
4. compare and contrast Instance-based learning techniques.
5. Analyze genetic algorithms and dimensionality reduction techniques

COMPUTER FORENSICS -B57PE4

COURSE OUTCOMES:

After completion of course the student will be able to

1. Understand Fundamentals of Computer Forensics.
2. Illustrate Evidence collection and Data seizure.
3. Processing crime and incident scenes using computer forensic analysis and validation.
4. compare and contrast different computer forensic tools, cellphone and mobile device forensics.
5. Explain whole disk encryption, windows registry and Microsoft startup tasks.

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INTERNET OF THINGS -B57PE4

COURSE OUTCOME:

After completion of course the student will be able to

1. Construct the IoT Logical design architecture with core functional stack.
2. Compare and contrast between IoT and M2M.
3. Design hardware and software for IoT using IoT design methodology and hon packages.
4. Explain the detailed features of IoT devices, Board and Interfaces.
5. Illustrate IoT design for a given application.

MACHINE LEARNING LABORATORY -B57PC6

COURSE OUTCOMES:

After completion of this course will enable students to

1. Make use of Data sets in implementing the machine learning algorithms.
2. Apply the machine learning concepts and algorithms in any suitable language of choice.

INTERNET OF THINGS LAB

COURSE OUTCOMES:

After completion of the course Student will be able to

1. Develop the programs in python.
2. Gain knowledge of Arduino IDE and different types of Arduino Board Write program using ArduinoIDE for Blink LED.
3. Develop programs using Arduino IDE and Arduino Board for RGB Led, RFID, NFC, MQTT Protocoland LED bilking using Raspberry Pi.

PREDICTIVE ANALYTICS - B58PE1

COURSE OUTCOMES:

After completion of the course, students will be able to

1. Describe the terminology of predictive analytics frame work and its Applications. –
2. Apply Logistic regression techniques.
3. Implement objective segmentation for performing prediction tasks for business needs. –
4. Apply time series methods for analyzing and predicting the business needs. –
5. Implement standard process for working with documents. –

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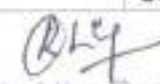**TKR COLLEGE OF ENGINEERING AND TECHNOLOGY**
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DESIGN PATTERNS - B58PE1

COURSE OUTCOMES:

After completion of the course the student will be able to

1. Explain about Design Pattern.
2. Design a document with all patterns for a given task.
3. Demonstrate structural pattern.
4. Analyze behavioral pattern.
5. Design a document with advanced behavioral patterns.

AD HOC WIRELESS NETWORKS - B58PE1

COURSE OUTCOMES:

After completion of the course the student will be able to

1. List and explain the various issues and applications of Ad hoc wireless networks.

2. Classify and Explain the working of MAC protocols for Ad-hoc wireless networks.

3. Discuss the issues in designing routing protocols and working of Table-Driven Routing protocols.

4. Analyze the challenges in designing Transport layer Protocols for Ad-hoc networks, Compare and contrastthe working of Transport protocols.

5. Identify the issues in designing Security Protocols for Ad-hoc networks focusing on the workingperformance of various security protocols.

SOFTWARE TESTING METHODOLOGIES - B58PE2

COURSE OUTCOMES:

After completion of the course the student will be able to

1. Understand the purpose of testing and taxonomy of bugs, explaining flow graphs and path testingprocess

2. Explain the process involved in testing transaction flow and data flow scenarios

3. Classify and compare domain testing

4. Illustrate regular expression and flow anomaly detection

5. Develop graph matrices and its applications

OPERATION RESEARCH - B58PE2

COURSE OUTCOME:

Understanding the problem, identifying variables & constants, formulas of optimization model andapplying appropriate optimization Tech.

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STORAGE AREA NETWORKS - B58PE2

COURSE OUTCOMES:

After completion of the course the student will be able to

1. Learn storage area networks characteristics and components, become familiar with SAN vendorsAnd their products. –

2. Compare and contrast integrated and modular storage systems.

3. Analyze various planned and unplanned outages.

4. Discuss various recovery topologies. –

5. Identify and manage the key areas of data to store.

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EEE- B. Tech - VII Semester (R18)

S. No	Course Code	Course Title	Hour per week			Total	Credits
			Lecture	Tutorial	Practical		
1	B27PC1	Power System Operation and Control	3	0	0	3	3
2	B27PE2	Professional Elective-III 1. Wind and Solar Energy Systems 2. Hybrid Electrical Vehicles 3. Flexible AC Transmission Systems	3	0	0	3	3
3	B27PC3	Power System Protection	3	0	0	3	3
4		Open Elective – III	3	0	0	3	3
5	B27PC5	Power systems Lab	0	0	3	3	1.5
6	B27PW6	Project Stage-I	0	0	8	8	4
					Total		17.5

EEE- B. Tech - VIII Semester (R18)

S. No	Course Code	Course Title	Hour per week			Total	Credits
			Lecture	Tutorial	Practical		
1	B28PE1	Professional Elective-IV 1. HVDC Transmission Systems 2. Computational Electromagnetics 3. Electromagnetic Waves	3	0	0	3	3
2	B28PE2	Professional Elective-V 1. Industrial Electrical Systems 2. Modern Control Theory 3. Electrical Drives	3	0	0	3	3
3	B28PE3	Professional Elective-VI 1. Utilization of Electrical Energy 2. High Voltage Engineering 3. Computer Aided Design of Electrical Machines	3	0	0	3	3
4	B28PW4	Project Stage-II	0	0	16	16	8
5	B28CT5	Comprehensive Test	0	0	0	0	3
					Total		20

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Subject Name: POWER SYSTEM OPERATION AND CONTROL

Subject Code: B27PC1	
	Cognitive level
Course outcomes	
1. Understand economic operation of power systems	L2
2. Analyseoptimal scheduling of hydrothermal system and modelling of speed governing system	L4
3. Understand and analysesingle area & two area load frequency control	L4
4. Analyse reactive power control and reactive power compensation in transmission systems	L4
5. Analysecomputer control of power system	L4

Subject Name: POWER SYSTEM PROTECTION

Subject Code: B27PC3	
	Cognitive level
Course outcomes	
1. Understand principles of power system protection.	L2
2. Analyse over current protection over current relay co-ordination and protection of parallel feeders.	L4
	L2
3. Analyse Protection schemes of generator, transformer and transmission	L4
4. Develop computer-aided protection and microprocessor-basedprotection schemes.	L3
5. Analyse the effect of power swings on distance relaying	L4

Subject Name: HVDCTRANSMISSION SYSTEMS

Subject Code: B28PE1	
	Cognitive level
Course outcomes	
1. Understand necessity of HVDC systemsandanalyze various HVDC converters	L4
2. Analyse various HVDC system control methods	
3. Analyse power flow in AC/DC systems.	L4
4. Understand various faults and protection methods in HVDC systems.	L4
5. Analyse the harmonics generation and design different types of filters	L2
	L4

Subject Name:COMPUTATIONAL ELECTROMAGNETICS

Subject Code: B28PE1	
	Cognitive level
Course outcomes	
1. Understand conventional design methodology and computer aided design aspects.	L2
2. Understand analytical methods of solving field equations, method of separation of variables	L4
3. Analysefinite difference method (FDM) andfinite element method (FEM)	
4. Understand the back ground of experimental methods likeelectrolytic tank, R-C network solution and Field plotting methods.	L4
5. Understandstatic, time-harmonic and transient problems in transformersand rotating machines	L2
	L2

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Subject Name: ELECTROMAGNETICWAVES

Subject Code: B28PE1

Course outcomes	Cognitive level
1. Analyse transmission line in terms of admittances.	L4
2. Understand basic laws of electromagnetic like Gauss's law, Ampere's Circuital law and Maxwell's equations.	L2
3. Analysewave equation for time harmonic fields and uniform plane wave.	L4
4. Analyse plane wave in arbitrary direction and power flow at media interface.	
5. Analyse wave guides and antennas	L4
	L4

Subject Name: INDUSTRIAL ELECTRICAL SYSTEMS

Subject Code: B28PE2

Course outcomes	Cognitive level
1. Understand the basic concepts of electrical system components	L2
2. Understand various residential and commercial electrical systems	L2
3. Understand and analyse various Illumination systemsandlighting schemes.	L4
4. Analyse various industrial electrical systems	
5. Analyse industrial electrical system automation	L4
	L4

Subject Name: MODERN CONTROL THEORY

Subject Code: B28PE2

Course outcomes	Cognitive level
1. Understand mathematical preliminariesof vectors and vector Spaces	L2
2. Model linear Continuous time physical systems and non-linearsystems	L3
3. Describing function analysis of nonlinear systems and stability analysis of non-linear systems	L4
4. Describe Phase-plane analysis of nonlinear control systems	L4
5. Stability analysis of the linear continuous time invariant systems by Lyapunov method	L4

Subject Name: UTILIZATION OF ELECTRICAL ENERGY

Subject Code: B28PE3

Course outcomes	Cognitive level
1. Understand starting and running characteristics, speed control, temperature rise and particular applications of electric drives	L2
2.Analysevarious Electric Heating and Welding methods	L4
3.Analyselaws of illumination and various Illumination methods	L4
4.Understand mechanics of train movement and analyze speed-time curves for different services	L4
5.Analyse tractive effort, specific energy consumption for given runand effect of varying acceleration and braking retardation	L4

Subject Name: ELECTRICAL DRIVES

Subject Code: B28PE3

Course outcomes	Cognitive level
1.Understand control of dc motors through phase-controlled rectifiers	L
2.Analyse four quadrant operation of dc drives through dual converters	L4
3.Analyse control of dc motors by choppers	L4
4.Analyse control of induction motor by ac voltage controllers and variable frequency control.	L4
5.Understand and analyse control of synchronous motors	L4

Subject Name: HIGH VOLTAGE ENGINEERING

Subject Code: B28PE3

Course outcomes	Cognitive level
1. Understand high voltage technology and applications	L2
2. Analyse breakdown in gaseous, solid and liquid dielectrics	L3
3. Understand generation and measurements of high voltages and currents	L2
4. Analyse the causes of over voltage phenomenon and insulation coordination.	L4
5. Analyse the non-destructive and high voltage testing of material and electrical apparatus	L4

Subject Name: COMPUTER AIDED ANALYSIS & DESIGN

Subject Code: B28PE3

Course outcomes	Cognitive level
1. Understand the concepts of computer-aided design and optimization	L2
2. Understand basic concepts of design.	L2
3. Understand application of finite element method in design	L3
4. Analyse computer aided design of electrical apparatus	L4
5. Analyse computer aided design of dc machines and transformers	L4

III SEMESTER (R20)

S.No.	Class	Course Code	NameoftheSubject	L	T	P	C
1	BS	CBSM12	Probability, Numerical Methods and Complex Analysis	3	1	0	4
2	PC	C23PC1	Electrical Circuit Analysis	3	1	0	4
3	PC	C23PC2	Analog Electronics	3	0	0	3
4	PC	C23PC3	Electrical Machines-1	3	1	0	4
5	PC	C23PC4	Electro Magnetic Fields	3	0	0	3
6	PC	C23PC5	Analog Electronics Lab	0	0	2	1
7	PC	C23PC6	Electrical Machines Lab-1	0	0	2	1
8	PC	C23PC7	Electrical Circuit Analysis Lab	0	0	2	1
9	MC	MC003	Cultural Activity	0	0	0	Satisfactory
Total Credits				15	3	6	21

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(AUTONOMOUS)
Medbowli, Meerpet, Hyderabad-97.

Subject Name : PROBABILITY, NUMERICAL METHODSANDCOMPLEX ANALYSIS	
Subject Code : CBSM12	
Course outcomes	Cognitive level
1. Apply the concept of Random variables and various discrete and continuous probability distribution and their properties to solve related problems.	L3
2. Utilizing the concept of sampling and hypothesis theoryCalculate mean, of sampling distributions and make important decisions for few samples which are taken from a large data.	L4
3. Solve problems to Find the root of a given equation using numerical methods.	L4
4. Choose the methods based on equal and unequal intervals to solve problems of interpolation.	L3
5. Analyse the complex functions with reference to their analyticity, integration using Cauchy's integral theorem& formula.	L5

Subject Name : ELECTRICAL CIRCUIT ANALYSIS	
Subject Code : C23PC1	
Course outcomes	Cognitive level
1.Understand different electrical network topologies.	L2
2.Solving first and second order electrical circuit using differential equations	L3
3.Analyze electrical circuits using Laplace Transforms	L4
4.Apply various analysis techniques for characterizing two-port networks.	L3
5. Develop analysis techniques to evaluate the performance of different filters	L3

Subject Name : ANALOG ELECTRONICS	
Subject Code : C23PC2	
Course outcomes	Cognitive level
1. Apply the knowledge of BJT to design practical amplifier circuits.	L2
2. Design electronic sub systems such as Feedback amplifiers, Oscillators.	L4
3. Design Power amplifiers.	L4
4. Design Linear and nonlinear wave shaping circuits with different inputs.	L4
5. Analyze Multi vibrators using transistors.	L3

Subject Name : ELECTRICAL MACHINES- I	
Subject Code : C23PC3	
Course outcomes	Cognitive level
1.Understand the basic principles of electromagnetism and their application in electrical machines.	L2

2.Analyze the construction, operation, and characteristics of DC generators	L4
3.Analyze the construction, operation, and characteristics of DC motors.	
4.Analyze the construction and operation of single-phase transformers.	L4
5.Analyze the construction and operation of three-phase transformers.	L4
	L4

Subject Name : ELECTRO MAGNETIC FIELDS

Subject Code : C23PC4

Course outcomes	Cognitive level
1. Understanding of vector fundamentals, including vector notation, vector addition, and scalar multiplication.	L2
2. Analyze the electrostatics, including Coulomb's Law and Gauss's Law.	L4
3. Analyze the behavior of dielectrics in response to static magnetic fields	L4
4. Analyze the magnetic force between differential current elements.	
5.Derive and apply the integral and point forms of Maxwell's equations.	L4
	L3

Subject Name : AnalogElectronicsLab

Subject Code :C23PC5

Course outcomes	Cognitive level
CO1:AnalyzeSinglestage amplifiers.	
CO2:AnalyzeFeedbackandPoweramplifiers.	
CO3:AnalyzeDiodeapplications.	
CO4:AnalyzethedifferenttypesofFETAmplifiers.	
CO5:AnalyzeTransistor applications	

Subject Name : ElectricalMachines Lab-1

Subject Code :C23PC6
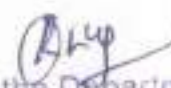
Course outcomes	Cognitive level
1. StartandcontroltheDifferentDC Machines.	L3
2. Assesstheperformanceofdifferentmachinesusingdifferenttestingmethods	L5
3. Identifydifferentconditionsrequiredtobesatisfiedforself-excitationofDCGenerators.	L2
4. SeparateironlossesofDCmachinesintodifferentcomponents.	L2
5. Analyze the construction, operation, and characteristics of DC motors.	L4

Subject Name : ElectricalCircuitAnalysisLab

Subject Code :C23PC7

Course outcomes	Cognitive level
1. Applysuitabletheoremstofindvoltage,current&powerinelectricalcircuits.	L2
2. Understandtimeresponseof RC/RL network.	L3
3. DetermineCircuitparametersfortwoport network.	L4

IV SEMESTER (R20)

S.No.	Class	Course Code	NameoftheSubject	L	T	P	C
1	ES	CESEM1	Engineering Mechanics	3	1	0	4
2	PC	C24PC1	DigitalElectronics	3	0	0	3
3	PC	C24PC2	ElectricalMachines-II	3	1	0	4
4	PC	C24PC3	Control Systems	3	1	0	4
5	PC	C24PC4	PowerSystem-I	3	0	0	3
6	PC	C24PC5	DigitalElectronicsLab	0	0	2	1
7	PC	C24PC6	ElectricalMachinesLab-II	0	0	2	1
8	PC	C24PC7	Control Systems Lab	0	0	2	1
9	MC	MC004	VideoswithSocial Messages	0	0	0	Satisfactory
Total Credits				15	3	6	21

Subject Name : ENGINEERING MECHANICS

Subject Code : CESEM1

Course outcomes	Cognitive level
1. Estimate the resultant forces acting on a body and assess the equilibrium of a body under the influence of a system of forces.	L5
2. Utilize advanced problem-solving strategies to address and resolve complex scenarios involving bodies subjected to frictional forces.	L3
3. Apply advanced mathematical techniques to ascertain the precise coordinates of the centroid and rigorously calculate the moment of inertia for the specified section.	L3 L4
4. Analyze and synthesize the dynamics and kinematics of a body engaged in rectilinear, curvilinear, rotatory motion, and rigid body motion.	L3
5. Solve problems using work energy equations for translation, fixed axis rotation, and plane motion and solve problems of vibration.	

Subject Name : DIGITAL ELECTRONICS

Subject Code : C24PC1

Course outcomes	Cognitive level
1. Apply their knowledge of numeric information in various forms to demonstrate in different bases, signed integers and codes.	L3
2. Apply theorems and postulates to minimize combinational functions in digital circuits.	L3 L5
3. Analyze and design the combinational logic circuits.	L5
4. Analyze and design the sequentiallogiccircuits.	
5. Design synchronous sequential finite state machines using mealy and moore models.	L5

Head of the Department
Electrical & Electronics Engineering
TKR College of Engineering & Technology
(AUTONOMOUS)
Medbowli, Meerpet, Hyderabad-97.

Subject Name : ELECTRICAL MACHNIES – II

Subject Code : C24PC2

Course outcomes	Cognitive level
1. Identify and understand different parts of Induction motor and specify their operations.	L2
2. Analyze the characteristics and speed control of Induction motor.	L4
3. Understand and analyze the construction, operation and characteristics of synchronous generator.	L4
4. Understand the parallel operation of synchronous machines and working principle of synchronous motor.	L4
5. Analyze the construction and working of single phase and special motors.	L4

Subject Name : CONTROL SYSTEMS

Subject Code : C24PC3

Course outcomes	Cognitive level
1. Demonstrate a comprehensive understanding of fundamental concepts in control systems, including feedback, stability, and control system components.	L2
2. Analyze and interpret the time response of linear time-invariant systems, including transient and steady-state responses.	L3
3. Apply stability analysis techniques like Routh criterion to understand and predict the behaviour of control systems.	L4
4. Apply frequency domain analysis techniques like Polar Plots and Nyquist Plots to assess system stability, gain and phase margins, and to design controllers.	L4
5. Understand and apply state-space representation for modelling dynamic systems.	L3

Subject Name : POWER SYSTEM-I

Subject Code : C24PC4

Course outcomes	Cognitive level
1. To Understand and Analyzethe operation of conventional generating stations and renewable sources of electrical power.	L2
2. To understand the economic aspects of energy and tariff methods.	L2
3. To Develop the electrical circuit parameters of transmission lines	L3
4. To Asses the electrical circuit parameters of transmission lines.	L5
5. To analyze various DC and AC distribution system circuits.	L4

Subject Name :DIGITALELECTRONICSLAB

Subject Code :C24PC5

Course outcomes	Cognitive level
1. Understand and analyzetheknowledgeof74XXIC's.	L4
2. Designvariouscombinational circuits usingvariousDigitalICs.	L5
3. DesignvarioussequentialcircuitsusingvariousDigitalICs.	L5

Subject Name :ELECTRICALMACHINESLAB–II	
Subject Code :C24PC6	
Course outcomes	**Cognitive level**
1. Assess the performance of different machines using different testing methods	L5 L4
2. To convert the Phase from three phase to two phase and vice versa	L5
3. Compensate the changes in terminal voltages of synchronous generator after estimating the change by different methods	
4. Control the active and reactive power flows in synchronous machines	L6 L3
5. Start different machines and control the speed and power factor	

Subject Name :CONTROLSYSTEMSLAB	
Subject Code :C24PC7	
Course outcomes	**Cognitive level**
1. How to improve the system performance by selecting a suitable controller and/or a compensator for a specific application.	L3
2. Applyvarioustime domainandfrequency domaintechniques toassessthesystemperformance	L3
3. Apply various control strategies todifferent applications (example: Power systems, electrical drivesetc).	L3
4. Testsystemcontrollabilityand Observabilityusingstatespacerepresentatio nandapplications of state space representation to various systems.	L4

S. No.	Class	CourseCode	Name of the Subject	L	T	P	Credits
1	PC	C25PC1	Power Electronics	3	1	0	4
2	PC	C25PC2	Electrical Measurements and Instrumentation	3	0	0	3
3	PE	C25PE3	Professional Elective-I	3	0	0	3
4	PC	C25PC4	Power System-II	3	0	0	3
5	OE	C25OE5	Open Elective-I	3	0	0	3
6	PC	C25PC6	Electrical Systems Simulation Lab	0	0	2	1
7	PC	C25PC7	Power Electronics Lab	0	0	2	1
9	HS	CHSE3	Advanced English Communication Skills Lab	0	0	4	2
8	PC	C25PC8	Electrical Measurements and Instrumentation Lab	0	0	2	1

Head of the Department
Electrical & Electronics Engineering
TKR College of Engineering & Technology
(AUTONOMOUS)
Medbowli, Meerpet, Hyderabad-97.

10	MC	MC005	MOOCs/Online Course	0	0	0	S
			TotalCredits				21

V SEMESTER (R20)

Professional Elective-I(Semester–V)

1. Electrical Machine Design
2. Power System Dynamics and Control
3. Digital Signal Processing

Open Elective–I(Semester– V)

1. Smart Grid Technologies
2. Electrical Engineering Materials
3. Nanotechnology

Subject Name :POWER SYSTEMS-II

Subject Code :C25PC4

Course outcomes	Cognitive level
1. Understand various parameters of types of transmission	L2
2. Understand and analyze, the performance of short and medium transmission lines.	L4
3. Analyze the performance of long transmission lines	L4
4. Understand and analyze travelling wave phenomenon, power system transients and various factors governing the performance of transmission line	L4
5. Analyze sag and tension calculations and overhead line insulators	L4

Subject Name :POWER ELECTRONICS

Subject Code :C25PC1

Course outcomes	Cognitive level
1. Understand the characteristics and performance of various power electronic devices	L2
2.Analyze single-phase and three phase half-wave, full-wave and semi controlled rectifiers with R-load and highly inductive load;	L4
3. Understand and analyze DC-DC Converters and AC voltage controllers	L4
4.Analyze single-phase voltage source inverters	L4
5 Analyze three-phase voltage source inverter in 180^0 and 120^0 modes	L4

Subject Name : ELECTRICAL MEASUREMENTS AND INSTRUMENTATION

Subject Code :C25PC2

Course outcomes	Cognitive level
1. Understand different types of measuring instruments, their construction, working principle and characteristics.	L2
2. Understand and analyze potentiometers & instrument transformers	L3
3. Analyze the energy and power measuring instruments.	L4
4. Apply the suitable bridge to measure unknown resistance, inductance and capacitance	L3
5. Understand and analyze various transducers and measurement of non-electrical quantities	L4

Subject Name : ELECTRICAL SYSTEMS SIMULATION LAB

Subject Code :C25PC6

Course outcomes	Cognitive level

1.	Design and Analyze electrical systems in time and frequency domain	L4
2.	Analyze various transmission lines and perform fault analysis	L4 L6
3.	Model Load frequency control of Power Systems	L6
4.	Design various Power Electronic Converters and Drives.	

Subject Name : POWER ELECTRONICS LAB

Subject Code :C25PC7

Course outcomes	Cognitive level
1. Understand the operating principles of various power electronic converters.	L2
2. Use power electronic simulation packages & hardware to develop the power Converters.	L5 L4
3. Analyze and choose the appropriate converters for various applications	

Subject Name : ADVANCED ENGLISH COMMUNICATION SKILLS LAB

Subject Code : CHSE3

Course outcomes	Cognitive level
1. Apply acquired vocabulary proficiently within diverse contexts to demonstrate advanced language usage.	L3 L3
2. Develop Listening and Speaking skills Effectively.	L5
3. Create advanced competence in academic reading and writing skills	L4
4. Categorize and Expand Job Prospects	L4
5. Distinguish yourself by effectively communicating in both formal and informal settings.	

Subject Name : ELECTRICAL MESEARUEMENTS AND INSTRUMENTATION LAB

Subject Code :C25PC8

Course outcomes	Cognitive level
1. Design and validate DC and AC bridges.	L3
2. Analyze the dynamic response and the calibration of few instruments.	L4
3. Learn about various measurement devices ,their characteristics, their operation and their limitations.	L3 L2
4. Understand statistical data analysis.	L2
5. Understand computerized data acquisition.	

Head of the Department
Electrical & Electronics Engineering
TKR College of Engineering & Technology
(AUTONOMOUS)
Medbowli, Meerpet, Hyderabad-97.

CO's of offered Professional Electives

Subject Name : ELECTRICAL MACHINE DESIGN	
Subject Code :C25PE-I	
Course outcomes	**Cognitive level**
1.Understand major considerations in electrical machine design and electrical engineering materials	L2
2.Understand and analyze sizing and main dimensions of a transformer.	L4
3.Understand and analyze sizing and main dimensions, of induction motor	L4
4.Analyze sizing and main dimensions, of synchronous machine	
5.Apply Computer aided Design (CAD) for electrical machines	L4
	L3

Subject Name : POWER SYSTEM DYNAMICS AND CONTROL	
Subject Code :C25PE-I	
Course outcomes	**Cognitive level**
1. Understand power system stability and stability problems in power system and its impact on power system operations and control	L2
2. Analyse linear dynamical systems and use of numerical methods.	
3. Modeling of synchronous machines and associated controllers	L4
4. Modeling of various power system components	L3
5. Understanding stability analysis and enhancing system stability	L3
	L4

Subject Name : DIGITAL SIGNAL PROCESSING	
Subject Code :C25PE-I	
Course outcomes	**Cognitive level**
1. Understand basics of digital signal processing and applications,	L2
2. Analyze discrete Fourier transforms and fast Fourier transforms:	L4
3. Analyze IIR digital filters	L4
4. Analyze FIR digital filters	L4
5. Understand multirate digital signal processing and finite word length effects.	L2

Head of the Department
Electrical & Electronics Engineering
TKR College of Engineering & Technology
(AUTONOMOUS)
Medbowli, Meerpet, Hyderabad-97.

CO's of offered Open Electives

Subject Name : SMART GRID TECHNOLOGIES
Subject Code : C25OE5

Course outcomes	Cognitive level
1. Identify the difference between smart grid& conventional grid	L2
2. Applysmartmeteringconceptstoindustrialandcommercialinstallations	L3
3. Develop the solutions in the areas of smart substations, distributed generation and wide area measurements	L3 L5
4. Asses with smart grid solutions using modern communication technologies.	L4
5. Analyze system network security and data management.	

Subject Name : ELECTRICAL ENGINEERING MATERIALS
Subject Code : C25OE5

Course outcomes	Cognitive level
1. Understand various types of dielectric materials and their properties	L2
2. Understand various types of magnetic materials and their properties	L2
3. Analyze large and very large-scale integration techniques (VLSI)	L4
4. Illustrate the materials for electrical applications	L2
5. Analyze special purpose materials like refractory materials, structural materials, radioactive materials.	L4

Subject Name : NANOTECHNOLOGY
Subject Code : C25OE5

Course outcomes	Cognitive level
1.Classify and understand nano structured materials	L2
2. Illustrate the properties of microstructure and defects in nano crystalline materials.	L2
3.Analyze the synthesis routes: bottom-up approaches and top-down approaches.	
4. Illustrate the tools to characterize nano materials.	L4
5. Illustrate various applications of nano materials	
	L2
	L2

VI SEMESTER (R20)

S. No.	Class	CourseCode	Name of the Subject	L	T	P	Credits

Head of the Department
Electrical & Electronics Engineering
TKR College of Engineering & Technology
(AUTONOMOUS)
Medbowli, Meerpet, Hyderabad-97.

1	HS	CHSM1	Business Economics and Financial Analysis	3	0	0	3
2	PC	C26PC1	Power System Protection	3	0	0	3
3	PC	C26PC2	Power System Operation and Control	3	0	0	3
4	PC	C26PC3	Microprocessors &Microcontrollers	2	0	0	2
5	PE	C26PE4	Professional Elective-II	3	0	0	3
6	OE	C26OE5	Open Elective-II	3	0	0	3
7	PC	C26PC6	Power System Lab	0	0	2	1
8	PC	C26PC7	Microprocessors & Microcontrollers Lab	0	0	2	1
9	ES	G26ES8	Python Programming Lab	0	0	4	2
10	MC	MC006	Personality Development/Skill Development Technical Events Internships	0	0	0	S
		TotalCredits					21

Professional Elective-II(Semester – VI)
1. Electrical Energy Conservation and Auditing
2. Computer Architecture
3. Line-Commutated and Active Rectifiers

Open Elective – II (Semester – VI)
1. Reliability Engineering
2. Optimization Techniques
3. Renewable Energy Sources

Subject Name : BUSINESS ECONOMICS AND FINANCIAL ANALYSIS

Subject Code :CHSM1

Course outcomes	Cognitive level
1. Analyse the total structure of the business & able to identify and classify the different types of business entities.	L4
2. Asses the demand & supply analyses with the help of various measures and types of Elasticity of demand.	L5
3. Develop the knowledge about production and cost analysis for product and services.	L3
4. Interpret the fundamental concepts related to financial accounting.	L5
5. Predict the financial position by analysing the financial statement of the company through various ratios.	L6

Subject Name :POWER SYSTEM PROTECTION

Subject Code :C26PC1

Course outcomes	Cognitive level
1. Understand principles of power system protection.	L2
2. Analyze over current protection over current relay co-ordination and protection of parallel feeders.	L4 / L2

Head of the Department
Electrical & Electronics Engineering
TKR College of Engineering & Technology
(AUTONOMOUS)
Medbowli, Meerpet, Hyderabad-97.

3. Analyze Protection schemes of generator, transformer and transmission	L4
	L3
4. Develop computer-aided protection and microprocessor-based protection schemes.	
	L4
5. Analyze the effect of power swings on distance relaying	

Subject Name :POWER SYSTEM OPERATION AND CONTROL

Subject Code :C26PC2

Course outcomes	Cognitive level
1. Understand economic operation of power systems	L2
2.Analyze optimal scheduling of hydrothermal system and modelling of speed governing system	L4
3.Understand and analyzesingle area & two area load frequency control	L4
4.Analyze reactive power control and reactive power compensation in transmission systems	L4
5. Analyzecomputer control of power system	L4

Subject Name : MICROPROCESSORS&MICROCONTROLLERS

Subject Code :C26PC3

Course outcomes	Cognitive level
1. Acquire the knowledge of internal architecture, organization of 8086 processor and can develop assembly language programming.	
2. Analyze internal architecture, memory organization of 8051 controller and can develop programming.	
3. Construct interfacing techniques to 8086 and 8051 and define various serial communication standards.	
4. Interpret the internal architecture and organization of ARM processor, and can develop programming.	
5. Build the knowledge of the internal architecture and organization of advanced ARM Processors.	

Subject Name : POWER SYSTEM LAB

Subject Code : C26PC6

Course out comes	Cognitive level
1. Test different types of relays and their characteristics.	L2
2. Apply various load flow techniques for the power flow studies.	L3
3. Understand Different protection methods	L2
4. Analyze various faults, ABCD constants, Regulation and transient stability of transmission line.	L4

Subject Name : MICROPROCESSORS & MICROCONTROLLERS LAB

Subject Code :C26PC7

Course outcomes	Cognitive level
1. Acquire the knowledge of internal architecture, organization of 8086 processor and can develop assembly language programming.	L3
	L4

Head of the Department
Electrical & Electronics Engineering
TKR College of Engineering & Technology
(AUTONOMOUS)
Medbowli, Meerpet, Hyderabad-97.

	Cognitive level
2. Analyze internal architecture, memory organization of 8051 controller and can develop programming	L3 L4
3. Construct interfacing techniques to 8086 and 8051 and define various serial communication standards.	L3 L4
4. Interpret the internal architecture and organization of ARM processor, and can develop programming.	
5. Build the knowledge of the internal architecture and organization of advanced ARM Processors.	

Subject Name : PYTHON PROGRAMMING LAB

Subject Code : C26ES8

Course outcomes	Cognitive level
1. Implement the fundamental programming elements: operators, statements, conditional and control flow statements.	
2. Use predefined functions and build functions.	
3. Use python modules and implement data structures to solve various computing problems.	
4. Apply oops concepts using python.	

CO's of offered Professional Electives

Subject Name : ELECTRICAL ENERGY CONSERVATION AND AUDITING

Subject Code : B26PE5

Course outcomes	Cognitive level
1. Understand the current energy scenario and importance of energy conservation.	L2
2. Illustrate basics of energy and its various forms	L2
3. Analyze energy management & audit	L4
4. Understand and analyzeenergy efficiency in electrical systems.	L4
5. Analyze energy efficiency in industrial systems	L4

Subject Name : COMPUTER ARCHITECTURE

Subject Code : B26PE5

Course outcomes	Cognitive level
1. Understand the basic concepts of o computer organization.	L2
2. Understand and analyze memory organization.	L4
3. Analyze Input – output Organization	L3
4. Understand and analyze 16 and 32 microprocessors	L4
5. Analyze Pipelining and different architectures	L4

Subject Name : LINE-COMMUTATED AND ACTIVE RECTIFIERS

Subject Code : B26PE5

Course outcomes	Cognitive level
1. Understand Diode rectifiers with passive filtering	L2

Head of the Department
Electrical & Electronics Engineering
TKR College of Engineering & Technology
(AUTONOMOUS)
Medbowli, Meerpet, Hyderabad-97.

2. Understand Thyristor rectifiers with passive filtering	L2
3. Analyze multi-pulse converter	L4 L4
4. Analyze Single-phase ac-dc single-switch boost converter	L4
5. Understand and analyze AC-DC bidirectional boost converter	

CO's of offered Open Electives

Subject Name : RELIABILITYENGINEERING

Subject Code : C26OE5

Course outcomes	Cognitive level
1. Understanding the Significance of the terms appearing in Reliability and probability.	L2
2. Understand or become aware of various failures, causes of failures and remedies for failures in practical systems.	L3 L3
3. Apply the fundamental knowledge of Reliability to modeling and analysis of series- parallel and Non-series parallel systems.	
4. Developing expressions for Time dependent and Limiting State Probabilities using Markov models.	L3
5. ApplyFrequency and duration techniques to multi state problems.	L3

Subject Name : OPTIMIZATION TECHNIQUES

Subject Code : C26OE5

Course outcomes	Cognitive level
1. Identify the need of optimization of engineering systems	L2
2. Understand optimization of electrical and electronics engineering problems	L2
3. Apply classical optimization techniques, linear programming, simplex algorithm, transportation problem	L3 L3
4. Develop unconstrained optimization and constrained non-linear programming and dynamic programming	L4 L5
5. Asses optimization problems.	

Subject Name : RENEWABLE ENERGY SOURCES

Subject Code : C26OE5

Course outcomes	Cognitive level
1. Understand the principles of wind power and solar photovoltaic pov generation, fuel cells.	L3
2. Assess the cost of generation for conventional and renewable energy plants	L4
3. Develop suitable power controller for wind and solar applications	L3

| 4. Design different energy storage methods | L3 |
| 5. Analyze the issues involved in the integration of renewable energy sources to the grid | L4 |

SEMESTER I(R22)

S.No	Class	Course Code	Name of the Subject	L	T	P	C
1	BS	D1BSM1	Linear Algebra and Ordinary Differential Equations	3	1	0	4
2	ES	D1ESCP1	C Programming for Problem Solving	3	0	0	3
3	BS	D1BSEP1	Engineering Physics	3	1	0	4
4	ES	D1ESEC1	Electrical Circuits	2	0	0	2
5	BS	D1BSEP2	Engineering Physics Lab	0	0	3	1.5
6	ES	D1ESCP2	C Programming for Problem Solving Lab	0	0	3	1.5
7	ES	D1ESCEG	Computer Aided Engineering Graphics	1	0	4	3
8	ES	D1ESEC2	Electrical Circuits Lab	0	0	2	1
Total Credits				12	2	12	20

SEMESTER II (R22)

S.No	Class	Course Code	Name of the Subject	L	T	P	C
1	BS	D2BSM3	Mathematical Transforms	3	1	0	4
2	BS	D2BSAC1	Applied Chemistry	3	1	0	4
3	ES	D2ESNA1	Network Analysis	3	0	0	3
4	HS	D2HSE1	English for Skill Enhancement	2	0	0	2
5	ES	D2ESBW1	Basic Workshop	0	0	3	1.5

Head of the Department
Electrical & Electronics Engineering
TKR College of Engineering & Technology
(AUTONOMOUS)
Medbowli, Meerpet, Hyderabad-97.

6	BS	D2BSAC2	Applied Chemistry Lab	0	0	3	1.5
7	HS	D2HSE2	English Language and Communication Skills Lab	0	0	2	1
8	ES	D2ESNA2	Network Analysis Lab	0	0	2	1
9	ES	D2ESPP1	Python programming Lab	0	1	2	2
10	MC	MC001	Environmental Science*	3	0	0	0
Total Credits				**14**	**3**	**12**	**20**

Subject Name : LINEAR ALGEBRA AND ORDINARY DIFFRENTIAL EQUATIONS

Subject Code : D1BSM1

Course outcomes	Cognitive level
1. Discuss the matrix representation of a set of linear equations and to analyses the solution of the system of equations.	L2
2. Reduce the quadratic form to canonical form using orthogonal transformation.	L3
3. Identify whether the given DE of first order is exact or not.	L3
4. Can find applications of first order ODE.	L2
5. Solve higher differential equation and apply the concept of differential equation to real world problems.	L4
6. Evaluating double integrals and applying them to compute the area so fregions.	L4

Subject Name : C PROGRAMMING FOR PROBLEM SOLVING

Subject Code : D1ESCP1

Course outcomes	Cognitive level
1. Learn the taxonomy of computers and C fundamentals (L2)	L2
2. Demonstrate arrays and functions to write c programming (L3)	L3
3. Write C programs using pointers and strings (L3)	L3
4. Analyze and write C programs using structures and unions (L4)	L4
5. Develop C programs for various applications using file I/O functions. (L5)	L5

Subject Name : ENGINEERING PHYSICS

Subject Code : D1BSEP1

Course outcomes	Cognitive level
1. Analyze the concepts of quantum mechanics and visualize the difference between conductor, semiconductor, and an insulator by classification of solids.	L4
2. Identify the role of semiconductor devices in science and engineering applications.	L4
3. Explore the fundamental properties of dielectric and energy materials for their applications.	L4 / L3

Head of the Department
Electrical & Electronics Engineering
TKR College of Engineering & Technology
(AUTONOMOUS)
Medbowli, Meerpet, Hyderabad-97.

4. Knowing the concepts related to magnetic and superconducting materials for different engineering applications. | L4
5. Explore the various aspects of lasers and optical fiber and their applications in diverse fields. |

Subject Name : ELECTRICAL CIRCUITS

Subject Code : D1ESEC1	Cognitive level
Course outcomes	L2
1. Understand network analysis , techniques using mesh and node analysis.	L4
2. EvaluatesteadystateandtransientbehaviorofcircuitsforDC andACexcitations.	L3
3. Analyze electriccircuitsusingnetworktheoremsandconceptsofcoupledcircuits.	

Subject Name : COMPUTER AIDED ENGINEERING GRAPHICS

Subject Code : D1ESCEG	Cognitive level
Course outcomes	L3
1. Apply computer aided drafting tools to create 2D and 3D objects	L4
2. Sketch conics and different types of solids	L4
3. Appreciate the need of Sectional views of solids and Development of surfaces of solids	L2
4. Read and interpret engineering drawings	L4
5. Conversion of orthographic projection into isometric view and vice versa manually and by using computer aided drafting	

Subject Name : MATHEMATICAL TRANSFORMS

Subject Code : D2BSM3	Cognitive level
Course outcomes	L2
1. Select and use the appropriate shift theorems in finding Laplace and inverse Laplace transforms.	
2. Use Laplace transforms techniques for solving differential equations.	L3
3. One will be able to find the expansion of a given function by Fourier series.	L3
4. Evaluating any periodic function in term of sines and cosines.	L4
5. Evaluating a non-periodic function in terms ofsine and cosine transforms.	L4
6. Understanding and apply Z-transforms, Inverse Z-transforms to solve Difference equations.	L4

Subject Name : APPLIED CHEMISTRY

Subject Code : D2BSAC1	Cognitive level
Course outcomes	L1
1. The students are able to understand the basic properties of water and its usage in domestic and industrial purposes.	
2. They will acquire the Knowledge of chemistry in Batteries.	L2
3. They can learn the fundamentals and general properties of polymers and their engineering materials.	L2
4. Students are able to understand the functioning of Engineering Materials.	L3
5. They can predict potential applications of chemistry and practical utility in	L4

order to become good engineers and entrepreneurs.	
Subject Name : NETWORK ANALYSIS	
Subject Code : D2ESNA1	
Course outcomes	**Cognitive level**
1. Observe the response of various R, L and C circuits for different excitations.	L2 L4
2. Examine the behavior of circuits using Fourier, Laplace transforms and transfer function of single port network.	L3
3. Obtain two port network parameters and applications and design of various filters	
Subject Name : ENGLISH FOR SKILL ENHANCEMENT	
Subject Code : D1HSE1	
Course outcomes	**Cognitive level**
1. Understand the importance of vocabulary and sentence structures.	L2
2. Choose appropriate vocabulary and sentence structures for their oral and written communication.	L3
3. Demonstrate their understanding of the rules of functional grammar.	L4
4. Develop comprehension skills from the known and unknown passages.	L4
5. Take an active part in drafting paragraphs, letters, essays, abstracts, précis and reports invarious contexts.	L3 L2
6. Acquire basic proficiency in reading and writing modules of English.	

Program Specific Outcomes (PSO):

R20

1. Comprehending and conceptualizing principles of operation, design, performance and testing of static and dynamic rotating machines and power electronics based electric drives.

2. Procuring knowledge in analysis, operation, control, protection, and simulation of electrical power systems for generation (hydro, thermal, nuclear and new renewable sources of energy), transmission, distribution and utilization

R18

1. Knowledge of principles of operation, design, performance and testing of static and dynamic rotating machines and power electronics based electric drives.

2. Knowledge of analysis, operation, control, protection, and simulation of electrical power systems for generation (hydro, thermal, nuclear and new& renewable sources of energy), transmission, distribution and utilization.

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B.TECH – CSE (DATA SCIENCE)
2022-2023 Academic year COs

INTRODUCTION TO OBJECT-ORIENTED PROGRAMMING & DATA STRUCTURES USING JAVA (CESOP1)

Course Outcomes:

1. Understand fundamentals of object-oriented programming in Java which includes defining classes, invoking methods
2. Implement the inheritance concept
3. Solve the exceptions in programs and recursion
4. Implement the Basic data structures and operations
5. Apply the ADTs and use the collections in Java

DATABASE MANAGEMENT SYSTEMS C83PC1

Course Outcomes:

After completion of this course, the student will be able to

1. Demonstrate the basic elements of a relational database management system, and identify the datamodels for relevant problems.
2. Design entity relationship model and convert entity relationship diagrams into RDBMS and formulateSQL queries on the data.
3. Apply normalization for the development of application software.
4. Understand transaction processing, concurrency control and recovery techniques.
5. Understand the indexing data structures and hashing.

R PROGRAMMING C83PC3

Course Outcomes:
After competition of this course, the students will be able to

1. Understand the basic functions of R and Create vectors in R.
2. Gain knowledge on creation of matrices and arrays in R.
3. Gain knowledge on creation of Factors and Data frames in R.
4. Understand and implement the searching and sorting techniques in R. and the file concepts in R.
5. Automate analyses and create new functions that extend the existing language features. Incorporatesfeatures found in object-oriented and functional programming languages.

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DATA VISUALIZATION C84PC4

Course Outcomes:

After completion of course, the students will be able to

1. Understand the visualization and Data basics
2. Understand the Visualization process and know the representation of Spatial & Geo spatial data
3. Analyze various Visualization techniques for Multivariate data and other structures of data
4. Interacting the different operators and different data spaces
5. Design effective visualization of modern toolkits

PYTHON PROGRAMMING C84PC5

Course Outcomes:

1. Examine Python syntax and semantics and be fluent in the use of Python flow control and functions.
2. Demonstrate proficiency in handling Strings and File Systems.
3. Create, run and manipulate Python Programs using core data structures like Lists, Dictionaries and useRegular Expressions.
4. Interpret the concepts of Object-Oriented Programming as used in Python.
5. Implement exemplary applications related to Network Programming, Web Services and Databases inPython.

WEB TECHNOLOGIES - C85PC1

COURSE OUTCOMES:

After completion of this course, the student will be able to

1. Gain knowledge on implementing server side scripting using PHP, know how to store andprocess data using XML.
2. Understand how to handle http requests based on the knowledge of servelets
3. Learn to implement server side programming with servelets, JSP
4. Learn to implement client side scripting, validation of forms, JS, AJAX programming.

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MACHINE LEARNING – C85PC2

COURSE OUTCOMES:

After completion of this course, the student will be able to
1. Understand the basic concepts such as decision trees and neural networks.
2. Develop the ability to formulate machine learning techniques to respective problems.
3. Apply machine learning algorithms to solve problems of moderate complexity.

NATURAL LANGUAGE PROCESSING - C86PC

COURSE OUTCOMES:

After completion of this course, the student will be able to
1. Show sensitivity to linguistic phenomena and an ability to model them with formal grammars.
2. Understand and carry out proper experimental methodology for training and evaluating empiricalNLP systems.
3. Able to design, implement, and analyze NLP algorithms
4. Able to design different language modeling Techniques.

C PROGRAMMING FOR PROBLEM SOLVING (D!ESCP1)

Course Outcomes:

Upon completion of course the student will be able to
1. Demonstrate the basic knowledge of computer hardware and software.
2. Write algorithms for solving problems.
3. Draw flow charts for solving problems.
4. Code a given logic in C programming language.
5. Gain knowledge in using C language for solving problems.

INTRODUCTION TO OBJECT-ORIENTED PROGRAMMING & DATA STRUCTUR
D2ESIOJ

Course Outcomes:

After completion of course, the students will be able to
1. Understand fundamentals of object-oriented programming in Java which includes defining classes,invoking methods
2. Implement the inheritance concept
3. Solve the exceptions in programs and recursion
4. Implement the Basic data structures and operations
5. Apply the ADTs and use the collections in Java

Program Outcomes (POs)

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PSO 1:Applying the concepts and practical knowledge in data analytical process of computing systems and statistical methods to multi-disciplinary problems.

PSO 2: Storing, processing, analysing and learning from data for effective decision-making while finding solutions for problems.

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DEPARTMENT OF CSE (ARTIFICIAL INTELLIGENCE & MACHINE LEARNING)

COURSE OUTCOMES (2022-23)

SUBJECT NAME: ENGLISH FOR SKILL ENHANCEMENT

SUBJECT CODE: D1HSE1

COURSE OUTCOMES:

1. Understand the importance of vocabulary and sentence structures.
2. Choose appropriate vocabulary and sentence structures for their oral and written communication.
3. Demonstrate their understanding of the rules of functional grammar.
4. Develop comprehension skills from the known and unknown passages.
5. Take an active part in drafting paragraphs, letters, essays, abstracts, précis and
6. reports invarious contexts.
7. Acquire basic proficiency in reading and writing modules of English.

SUBJECT NAME: ENGINEERING CHEMISTRY   **SUBJECT CODE: D1BSEC1**

COURSE OUTCOMES:

1. Students will acquire the basic knowledge of conductance in Metals and Bond Structures.
2. The students are able to understand the basic properties of water and its usage in domestic and industrial purposes.
3. They will acquire the Knowledge of chemistry in Batteries.
4. They can learn the fundamentals and general properties of polymers and other engineering materials.
5. They can predict potential applications of chemistry and practical utility in order to become good engineers and entrepreneurs.

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SUBJECT NAME: LINEAR ALGEBRA AND ORDINARY DIFFERENTIAL EQUATIONS

SUBJECT CODE: D1BSM1

COURSE OUTCOMES:

1. Discuss the matrix representation of a set of linear equations and to analyses the solution of thesystem of equations.
2. Reduce the quadratic form to canonical form using orthogonal transformation.
3. Identify whether the given DE of first order is exact or not.
4. Can find applications of first order ODE.
5. Solve higher differential equation and apply the concept of differential equation to real worldproblems.
6. Evaluating double integrals and applying them to compute the areas of regions.

SUBJECT NAME: C PROGRAMMING FOR PROBLEM SOLVING

SUBJECT CODE: D1ESCP1

COURSE OUTCOMES:

1. Learn the taxonomy of computers and C fundamentals (L2)
2. Demonstrate arrays and functions to write c programming (L3)
3. Write C programs using pointers and strings (L3)
4. Analyze and write C programs using structures and unions (L4)
5. Develop C programs for various applications using file I/O functions. (L5)

SUBJECT NAME: IT WORKSHOP AND ELEMENTS OF COMPUTER ENGINEERING
SUBJECT CODE: D1ESCEG

COURSE OUTCOMES:

1. Apply knowledge for computer assembling and software installation. (L3)
2. Solve the trouble shooting problems. (L4)
3. Apply the tools for preparation of PPT, Documentation and budget sheet (L3)
4. Create standard documents and research documents using Latex. (L5)
5. Create project plans. (L5)

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SUBJECT NAME: COMPUTER AIDED ENGINEERING GRAPHICS

SUBJECT CODE: D1ESCEG

COURSE OUTCOMES:

1. Apply computer aided drafting tools to create 2D and 3D objects
2. Sketch conics and different types of solids
3. Appreciate the need of Sectional views of solids and Development of surfaces of solids
4. Read and interpret engineering drawings
5. Conversion of orthographic projection into isometric view and vice versa manually and byusing computer aided drafting

SUBJECT NAME: ENGLISH LANGUAGE AND COMMUNICATION SKILLS LAB
SUBJECT CODE: D1HSE2

COURSE OUTCOMES:

1. Understand the nuances of English language through audio- visual experience and groupactivities.
2. Neutralize their accent for intelligibility
3. Speak with clarity and confidence which in turn enhances their employability skills

SUBJECT NAME: ENGINEERING CHEMISTRY LAB

SUBJECT CODE: D1BSEC2

COURSE OUTCOMES:

1. The concepts of error and its analysis and can also develop the skills to tabulate the experimental data and derive valid conclusions.
2. Hands on experience in performing the electro-analytical techniques such as conductometry, potentiometry and pH metry.
3. The ability to prepare polymers.
4. Estimation of Surface tension and viscosity of Lubricant oil.

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SUBJECT NAME: C PROGRAMMING FOR PROBLEM SOLVING LAB
SUBJECT CODE: D1ESCP3

COURSE OUTCOMES:

1. Design and test programs to solve mathematical and scientific problems. (L5)
2. Write structured programs using control structures and functions. (L3)

SUBJECT NAME: BUSINESS ECONOMICS AND FINANCIAL ANALYSIS
SUBJECT CODE: D2HSBF

COURSE OUTCOMES:

1. Analyze the total structure of the business and able to identify and classify the
2. different types of business entities.
3. Asses the demand and supply analyses with the help of various measures and types of elasticity of demand.
4. Infer the knowledge about production and cost analysis for product and services.
5. Interpret the fundamental concepts related to financial accounting.
6. Predict the financial position by analyzing the financial statement of the company through various ratios.

SUBJECT NAME: APPLIED PHYSICS   **SUBJECT CODE: D2HSBF**

COURSE OUTCOMES:

1. Summarize the fundamentals of quantum mechanics to understand the quantum physics in the physical world,
2. By understand the fundamentals of band theory of solids; students will be able to classify the materials on the basis of energy gap.
3. Knowing the physics behind the semiconductors, enables the students to use them in different engineering applications
4. Establishing a strong foundation on the different kinds of opto-electronic, dielectric and display materials and paves a way for them to use in at various technical and engineering applications
5. Knowledge on fiber optics and quantum information enables the students to apply them in systems like optical communications and advanced quantum communication

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SUBJECT NAME: STATISTICAL METHODS AND VECTOR CALCULUS
SUBJECT CODE: D2BSM5

COURSE OUTCOMES:

1. Apply Statistical logic for solving the problems.
2. Analyze the qualitative & quantitative data.
3. Analyze the time series for the given data
4. Explain and compute derivatives of vector valued functions, gradient functions
5. Evaluate the line- surface and volume integrals and converting them from one to another.

SUBJECT NAME: BASIC ELECTRICAL ENGINEERING   SUBJECT CODE: D2ESBEE

COURSE OUTCOMES:

1. Understand and analyze DC, AC circuits using basic principles.
2. Analyze and evaluate electrical circuits using various theorems.
3. Understand the characteristics and performance of Electrical Machines and Transformers.
4. Understand the applications of various electrical installations.

SUBJECT NAME: DATA STRUCTURES   SUBJECT CODE: D2ESDS

COURSE OUTCOMES:

1. Analyze time and space complexity of various problems and distinguish various data structures.L4
2. Demonstrate various Abstract Data Types. L3
3. Analyze the Binary tree and Disjoint set ADT L4
4. Analyze and implement various kinds of searching and sorting techniques L4
5. Design programs using a variety of data structures such as graphs and search trees L5

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SUBJECT NAME: APPLIED PHYSICS LAB

SUBJECT CODE: D2BSAP2

COURSE OUTCOMES:

1. Identify the V-I characteristics of Laser diode.
2. Evaluate the numerical and bending loss of given optical fiber.
3. Analyze the V-I characteristics of LED and photodiode devices.
4. Identify the type of semiconductor by using Hall Effect experiment.
5. Calculate the Plank's constant using Photocell.

SUBJECT NAME: BASIC ELECTRICAL AND SIMULATION LAB

SUBJECT CODE: D2ESBES

COURSE OUTCOMES:

1. Apply various laws to solve electrical networks.
2. Apply network theorems to solve complex electrical networks.
3. Evaluate the performance of different types of Electrical machines and single phase transformer by conducting various tests
4. Understand and analyze electrical installations using different lamp controlled methods, staircase wiring and different wiring connection

SUBJECT NAME: DATA STRUCTURS LAB

SUBJECT CODE: D2ESDSL

COURSE OUTCOMES:

1. After learning the contents of this course, the student will be able to
2. Identify the appropriate data structures and algorithms for solving real world problems. L2
3. Apply various searching and sorting techniques for solving the given problems L3
4. Apply various data structures such as stacks, queues, search trees, and hash tables to solve the computing problems.L3
5. Implement different disjoint set operations and k-d trees.L3

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SUBJECT NAME: Business Economics and Financial Analysis **SUBJECT CODE: CHSM1**

COURSE OUTCOMES:

1. Analyze the total structure of the business & able to identify and classify the different types of business entities.
2. Assess the demand & supply analyses with the help of various measures and types of Elasticity of demand.
3. Infer the knowledge about production and cost analysis for product and services.
4. Interpret the fundamental concepts related to financial accounting.
5. Predict the financial position by analyzing the financial statement of the company through various ratios.

SUBJECT NAME: Statistical Methods   **SUBJECT CODE:** CBSM5

COURSE OUTCOMES:

1. Apply Statistical logic for solving the problems.
2. Analyze the qualitative & quantitative data.
3. Apply the sampling techniques.
4. Find the error in sampling distributions.
5. Test the hypothesis and give the inference to the given data.
6. Predict the value of dependent variable by regression analysis.

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SUBJECT NAME: Logic Circuits Design   **SUBJECT CODE:** CESLC1

COURSE OUTCOMES:

1. Understand the various number systems and logic gates.
2. Solve Boolean expressions using minimization methods and design the sequential and combinational circuits.
3. Study the flip flops and their excitations tables.
4. Learn register transfer language and micro-operations.
5. Understand about memory, RAM and ROM.

SUBJECT NAME: Database Management Systems   **SUBJECT CODE:** C73PC1

COURSE OUTCOMES:

1. Demonstrate the basic elements of a relational database management system, and identify the data models for relevant problems.
2. Design entity relationship model and convert entity relationship diagrams into RDMS and formulate SQL queries on the data.
3. Apply normalization for the development of application software.
4. Understand transaction processing, concurrency control and recovery techniques.
5. Understand the indexing data structures and hashing.

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SUBJECT NAME: Data Structures   **SUBJECT CODE: C73PC2**

COURSE OUTCOMES:

1. Understand the concepts of time and space complexity.
2. Understand the concept of Abstract Data Type.
3. Choose appropriate data structures to represent data structures to represent data items in real world problems.
4. Analyze the search and space complexities of algorithms.
5. Design programs using a variety of data structures such as stacks, queues, hash tables, binary trees, search trees, heaps, graphs and B-trees and implement various searching and sorting techniques.

SUBJECT NAME: Operating Systems   **SUBJECT CODE: C73PC3**

COURSE OUTCOMES:

1. Understand the basic concepts of operating system.
2. Understand the CPU scheduling and process scheduling.
3. Detect deadlocks and recovery the deadlocks using different mechanisms.
4. Understand the virtual memory management and storage file management system.
5. Implementing the file system.

SUBJECT NAME: Logic Circuits Design Lab   **SUBJECT CODE:** CESLC2

COURSE OUTCOMES:

1. Apply the fundamentals of digital logic gates to design combinational and sequential circuits.
2. Analyze and interpret the results obtained for logic gates and various combinational and sequential circuits.

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SUBJECT NAME: Database Management Systems Lab   **SUBJECT CODE:** C73PC4

COURSE OUTCOMES:

1. Design and implement a database schema for a given problem.
2. Apply the normalization techniques for development of application software to realistic problems.
3. Formulate queries using SQL DML/DDL/DCL commands.
4. Develop application programs using PL/SQL.

SUBJECT NAME: Data Structures Lab

SUBJECT CODE: C73PC5

COURSE OUTCOMES:

1. Able to identify the appropriate data structures and algorithms for solving real world problems.
2. Able to implement various kinds of searching and sorting techniques.
3. Able to implement data structures such as stacks, queues, search trees and hash tables to solve various computing problems.
4. Able to implement different disjoint set operations and k-d trees

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SUBJECT NAME: Probability &Algebra

SUBJECT CODE: CBSM6

COURSE OUTCOMES:

1. Learn the concept of basic probability to solve the real life problems.
2. To solve problems on discrete and continuous random variables.
3. Learn various discrete and continuous probability distribution and their properties.
4. Solve problems based on area properties of standard normal distribution.
5. Illustrate the basic terminology of functions, relations, sets and demonstrate knowledge of their associated operations.
6. Understand the importance of algebraic properties with regard to working within various number systems.

SUBJECT NAME: Introduction to computer vision

SUBJECT CODE: C74PCI

COURSE OUTCOMES:

1. Understanding of the basic knowledge, analysis and design of complex systems.
2. Identify the minimum requirements for the development of application.
3. Understand the objective of designing required process models and architectural styles.
4. Apply the process of validation and verification for a developed application.
5. Understand the process of deploying the quality and risk management for a developed application.

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SUBJECT NAME: Software Engineering   **SUBJECT CODE:** C74PC2

COURSE OUTCOMES:

1. Understanding of the basic knowledge, analysis and design of complex systems.
2. Identify the minimum requirements for the development of application
3. Understand the objective of designing required process models and architectural styles.
4. Apply the process of validation and verification for a developed application.
5. Understand the process of deploying the quality and risk management for a developed application.

SUBJECT NAME: Design and Analysis of Algorithms   **SUBJECT CODE:** C74PC3

COURSE OUTCOMES:

1. Argue the correctness of algorithms using inductive proofs and invariants.
2. Apply important algorithmic design paradigms and methods of analysis.
3. Synthesize efficient algorithms in common engineering design situations such as the greedy, divide and conquer, dynamic programming, backtracking and branch-bound.
4. Explain the different ways to analyze randomized algorithms.
5. Differentiate between tractable and intractable problems.

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SUBJECT NAME: Formal Language & Automata Theory   **SUBJECT CODE:** C74PC4

COURSE OUTCOMES:

1. Understand the concept of abstract machines and build up the ability to recognize the formal languages.
2. Employ finite state machines for modeling and solving computing problems.
3. Design context free grammars for formal languages.
4. Normalizing the context free grammar and design Turing machines.
5. Distinguish between decidability and intractable problems.

SUBJECT NAME: R Programming

SUBJECT CODE: C74PC5

COURSE OUTCOMES:

1. Understand the basic functions of R and create vectors in R.
2. Gain knowledge on creation of matrices and arrays in R.
3. Gain knowledge on creation of factors and Data Frames in R.
4. Understand and implement the searching and sorting techniques in R and the file concepts in R.
5. Automate analyses and create new functions that extend the existing language features, incorporates features found in object oriented and functional programming languages.

SUBJECT NAME: Scripting Languages Lab

SUBJECT CODE: C74PC6

COURSE OUTCOMES:

1. Write the PHP scripts and execute in Server Environment.
2. Write the RUBY scripts and execute
3. Write the PERL scripts and execute

SUBJECT NAME: R Programming Lab

SUBJECT CODE: C74PC1

COURSE OUTCOMES:

1. Implement empirical economic analyses
2. Participate in online data science challenges.
3. Learn on your own further R, or other programming Languages.

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SUBJECT NAME: Introduction to AI & Neural Networks **SUBJECT CODE:** C75PC1

COURSE OUTCOMES:

1. To gain basic knowledge on understanding the AI phenomenon, use state space representations and apply heuristic techniques
2. To apply knowledge representation issues to build predicate logic and knowledge rules.
3. To understand the uncertainty measures for symbolic reasoning, learn how neural networks are modelled.
4. To develop a learning process based on supervised and unsupervised mechanism.
5. To develop unconstrained optimization techniques, for single layer perceptron, derive output for multilayer perceptron, using decision rule, Feature detection, Back Propagation and differentiation, Hessian Matrix.

SUBJECT NAME: Python Programming   **SUBJECT CODE:** C75PC2

COURSE OUTCOMES:

1. Understand the usage of procedural statements assignments, conditional statements, loops, method calls and different data structures.
2. Design code, and test small python programs.
3. Understand the concepts of object oriented programming as used in Python: classes, subclasses, properties, inheritance and overriding.

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Medbowli, Meerpet, Hyderabad-97.

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SUBJECT NAME: Natural Language Processing   **SUBJECT CODE: C75PC3**

COURSE OUTCOMES

1. To develop sensitivity to linguistic phenomena and an ability to model them with formal grammars.
2. To understand and carry out proper experimental methodology for training and evaluating empirical NLP Systems.
3. To design, implement and analyse Natural Language Processing Algorithms.
4. To design different language modeling techniques.

SUBJECT NAME: Introduction to Machine Learning   **SUBJECT CODE: C75PC4**

COURSE OUTCOMES:

1. Know how to, design a learning system based on well-posed problems, study perspectives issues in machine learning. Understand how to imply concept learning in general to specific ordering.
2. Implement learning mechanism using decision trees. Understand the basic phenomenon of artificial neural networks and infer the evaluation hypothesis mechanism for learning mechanism.
3. Gain insights how to apply bayes theory, computational theory and instance base on learning mechanism. Classify the learnt information based on hypothesis for predicting probabilities.
4. Learn to apply set of rules and analyse the learning mechanism with perfect domain theories like PROLOG-EGB
5. Know in brief how to combine inductive and Analytical learning approaches.

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SUBJECT NAME: Distributed Databases   **SUBJECT CODE: C75PE5A**

COURSE OUTCOMES:

1) Know the necessity of distributed database concepts, through architecture and design.
2) Learn to process queries, decompose and to optimize them.
3) Understand the control mechanisms and algorithms that are implied through transaction management.
4) Identify issues like reliability, parallelism, associated in developing distributed database system.
5) Understand and relate the concepts of Object oriented design paradigm to Distributed Databases.

SUBJECT NAME: Smart Grid Technologies   **SUBJECT CODE: C25OE5**

COURSE OUTCOMES:

1. Appreciate the difference between smart grid & conventional grid
2. Apply smart metering concepts to industrial and commercial installations.
3. Formulate solutions in the areas of smart substations, distributed generation and wide area measurements
4. Come up with smart grid solutions using modern communication technologies

SUBJECT NAME: ML Lab Using Python   **SUBJECT CODE: C75PC7**

COURSE OUTCOMES:

1. Make use of Data sets in implementing the machine learning algorithms.
2. Implement the machine learning concepts and algorithms in any suitable language of choice.

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SUBJECT NAME: Natural Language Processing Lab   **SUBJECT CODE: C75PC8**

COURSE OUTCOMES:

1. Implementing experimental methodology for training and evaluating empirical NLP systems.
2. Show sensitivity to linguistic phenomenona and an ability to model them with formal grammars
3. Design, implement and analyze NLP algorithms
4. Design different language modeling techniques.

SUBJECT NAME: Fundamentals of Management   **SUBJECT CODE: CHSM2**

COURSE OUTCOMES:

1. To infer the basic knowledge of management functions, levels and evolution of Management
2. To ensure the students in decision making problem solving for the issues in corporate in the organization
3. To acquire the knowledge of entire organization design and structure.
4. To perceive the strategically decision in selection, requirement training and development
5. To enact and impose the qualities of a leader,mentor and coach.

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SUBJECT NAME: Data Warehousing and Data Mining   **SUBJECT CODE:C76PC1**

COURSE OUTCOMES:

1. Gain insights on the necessity of building a data warehouse, and basic operations that can be performed on it.
2. Understand the importance and process of knowledge discovery from data through its functionalities.
3. Analyse the algorithms developed for understanding Association rule functionality
4. Learn how to classify the knowledge based on the information and study different proposed algorithms for classifying the knowledge.
5. Analyse how to group similar knowledge based on the information and study different approaches proposed for grouping the information

SUBJECT NAME: Advanced Computer Vision   **SUBJECT CODE: C76PC2**

COURSE OUTCOMES:

1. To understand the significance of geometric transformations, coordinate parameters of objects that are viewed using 2D and 3D.
2. To implement feature detection and matching concepts, involving segmentation and feature based alignment.
3. To frame structure while the objects are in motion, estimate how dense is the object from the surface in motion.
4. To understand how, images are joined, and aligned; photographs are captured, using mathematical functions.
5. To construct images of objects in 3D representation.

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SUBJECT NAME: Wireless Networks   **SUBJECT CODE: C76PE3B**

COURSE OUTCOMES:

1. List and explain the various issues and applications of Ad hoc wireless networks.
2. Classify and Explain the working of MAC protocols for Ad-hoc wireless networks
3. Discuss the issues in designing routing protocols and working of Table-Driven Routing protocols.
4. Compare and contrast the working of various On-Demand Routing protocols.
5. Analyze the challenges in designing Transport layer Protocols for Ad-hoc networks, Compare and contrast the working of Transport protocols.
6. Identify the issues in designing Security Protocols for Ad-hoc networks focusing on the working performance of various security protocols

SUBJECT NAME: NETWORK SECURITY   **SUBJECT CODE: C76PE4C**

COURSE OUTCOMES:

1. Learn and understand how to apply security mechanisms across transport layer.
2. Understand and learn the security mechanism involved across a wireless network
3. Understand about types of intruders and respective detection mechanism, malicious software, and viruses.
4. Know the need and significance of firewall and its types.
5. Gain knowledge on basic concepts of Network Management System, legal and ethical aspects of establishing a network.

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SUBJECT NAME: ADVANCED COMMUNICATION SKILLS LAB

SUBJECT CODE: CHSE3

COURSE OUTCOMES:

1. Acquire vocabulary and use it contextually
2. Listen and speak effectively
3. Develop proficiency in academic reading and writing
4. Increase possibilities of job prospects
5. Communicate confidently in formal and informal contexts
6. Develop interpersonal communication skills

SUBJECT NAME: DATA WAREHOUSING AND DATA MINING LAB

SUBJECT CODE: C76PC5

COURSE OUTCOMES:

1. Learn how to build a data warehouse and query it (using open source tools like Pentaho Data Integration and Pentaho Business Analytics),
2. Learn to perform data mining tasks using a data mining toolkit (such as open-source WEKA),
3. Understand the data sets and data preprocessing,
4. Demonstrate the working of algorithms for data mining tasks such association rule mining, classification, clustering, and regression,
5. Exercise the data mining techniques with varied input values for different parameters.

SUBJECT NAME: ADVANCED COMPUTER VISION LAB

SUBJECT CODE: C76PC6

COURSE OUTCOMES:

1. To develop novel and efficient techniques for the extraction of quantitative descriptions of viewed objects from a variety of images and image sequences.
2. To translate those techniques into high quality software tools that can be used to address real world problems.

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DEPARTMENT OF CIVIL ENGINEERING
SUBJECTWISE COURSE OUTCOMES

SEMESTER -I

Subject: Linear Algebra and Ordinary Differential Equations -D1BSM1

1. Discuss the matrix representation of a set of linear equations and to analyses the solution of the system of equations.
2. Reduce the quadratic form to canonical form using orthogonal transformation.
3. Identify whether the given DE of first order is exact or not.
4. Can find applications of first order ODE.
5. SSolve higher differential equation and apply the concept of differential equation to real world problems.
6. Evaluating double integrals and applying them to compute the areas of regions.

Subject: Engineering Physics - D1BSEP1

1. Analyze the concepts of quantum mechanics and visualize the difference between conductor, semiconductor, and an insulator by classification of solids.
2. Identify the role of semiconductor devices in science and engineering applications.
3. Explore the fundamental properties of dielectric and energy materials for their applications.
4. Knowing the concepts related to magnetic and superconducting materials for different engineering applications.
5. Explore the various aspects of lasers and optical fiber and their applications in diverse fields.

Subject: Basic Electrical and Electronics Engineering - D1ESBEE1

1. To analyze and solve Electrical circuits using Network Laws and Theorems.
2. To understand and analyze Basic Electric and Magnetic Circuits.
3. To study the working principles of Electrical Machines.
4. To introduce components of Low Voltage Electrical Installations.
5. To identify and characterize Diodes and various types of Transistors.

Subject: Engineering Mechanics - D1ESEM1

1. Draw free body diagrams and determine the resultant of forces and/or moments.
2. Apply laws of mechanics to determine efficiency of simple machines with consideration of friction.
3. Determine the centroid and second moment of area of sections.
4. Analyze statically determinate planar frames. Analyze the motion and calculate trajectory characteristics.
5. Apply Newton''s laws and conservation laws to elastic collisions and motion of rigid bodies.

Subject: Engineering Physics Lab - D1BSEP2

1. Identify the V-I characteristics of Laser diode.
2. Evaluate the numerical aperture and bending loss of a given optical fiber.
3. Analyze the V-I characteristics of LED and photodiode devices.
4. Identify the type of semiconductor by using Hall Effect experiment.
5. Measure the Plank's constant using Photocell.

Subject: Computer Aided Drawing Lab - D1ESDW

1. Preparing Working Drawings to Communicate the Ideas and Information.
2. Read, Understand & Interpret Engineering Drawings.

Subject: Basic Electrical & Electronics Engineering Lab - D1ESBEE2

1. Apply various laws to solve electrical networks.
2. Apply network theorems to solve complex electrical networks.
3. Evaluate the performance of different types of Electrical machines and single phase transformer by conducting various tests.
4. Understand and analyze electrical installations using different lamp controlled methods, stair case wiring and different wiring connection.
5. Understand to design different circuits.
6. Apply various devices to real time problems.

Subject: Basic Workshop - D1ESBW1

1. Ability to design and model different prototypes in the carpentry trade such as cross lap joint, Dove tail joint.
2. Ability to design and model various basic prototypes in the trade of fitting such as straight and L fit.
3. Ability to make various basic prototypes in the trade of Tin smithy such as rectangular tray, Scoop.
4. Ability to perform various basic House Wiring techniques such as connecting one lamp with one switch, connecting two lamps with one switch, Series wiring.
5. Ability to design and model various basic prototypes in the trade of Welding such as Lap joint, Butt joint.

SEMESTER – II

Subject: Numerical Methods and Applications - D2BSM2

1. Find the root of an equation using numerical methods.
2. Finding integral values using numerical techniques.
3. To find the numerical solution of PDE.
4. Learn the methods of interpolation.
5. Solve the problems using numerical differentiation.

Subject: C Programming for Problem Solving - D2ESCP1

1. Learn the taxonomy of computers and C fundamentals.
2. Demonstrate arrays and functions to write c programming.
3. Write C programs using pointers and strings.
4. Analyze and write C programs using structures and unions.
5. Develop C programs for various applications using file I/O functions.

Subject: English for Skill Enhancement - D2HSE1

1. Understand the importance of vocabulary and sentence structures.
2. Choose appropriate vocabulary and sentence structures for their oral and written communication.
3. Demonstrate their understanding of the rules of functional grammar.
4. Develop comprehension skills from the known and unknown passages.
5. Take an active part in drafting paragraphs, letters, essays, abstracts, precis and reports in various contexts.
6. Acquire basic proficiency in reading and writing modules of English.

Subject: Applied Chemistry - D2BSAC1

1. The students are able to understand the basic properties of water and its usage in domestic and industrial purposes.
2. They will acquire the Knowledge of chemistry in Batteries.
3. They can learn the fundamentals and general properties of polymers and their engineering materials.
4. Students are able to understand the functioning of Engineering Materials.
5. They can predict potential applications of chemistry and practical utility in order to become good engineers and entrepreneurs.

Subject: Engineering Graphics - D2ESEG1

1. To draw lines, curves and show dimensions as per BIS standards.
2. For a given four quadrant system, able to find the position of an object in any one of the four quadrants with respect to observer, object and the reference planes and to construct the projections for points, lines and planes.
3. To prepare sectional views of a 3D object for understanding internal construction details.
4. To develop 3D Solids and able to visualize the object in simple and in section.
5. To construct Top View, Front View and Side View for a given three-dimensional object.

Subject: Applied Chemistry Lab - D2BSAC2

1. The concepts of error and its analysis and can also develop the skills to tabulate the experimental data and derive valid conclusions.

2. Hands on experience in performing the electro-analytical techniques such as conductometry, potentiometry and pH metry.
3. The ability to prepare polymers.
4. Estimation of Surface tension and viscosity of Lubricant oil.

Subject: Basic C Programming for Problem Solving Lab - D2ESCP2

1. Design and test programs to solve mathematical and scientific problems.
2. Write structured programs using control structures and functions.

Subject: English Language and Communication Skills Lab - D2HSE2

1. Understand the nuances of English language through audio- visual experience and group activities.
2. Neutralise their accent for intelligibility.
3. Speak with clarity and confidence which in turn enhances their employability skills.

SEMESTER-III

Subject: Numerical Methods - CBSM9

1. Evaluate the root of an equation using numerical methods.
2. Learn the methods and solve the problems of interpolation.
3. Solve the problems using numerical differentiation.
4. Evaluating integral values using numerical techniques.
5. Solve the numerical solution of ODE.
6. Solve the numerical solution of PDE.

Subject: Building Materials, Construction & Planning - C13PC1

1. Identify various building materials required for good quality construction & better planning.
2. Have the knowledge of construction methodology, materials and its planning.
3. Know about the functional design of various elements such as arches, lintels, floors, stairs, doors & windows.
4. Have the complete knowledge of form work and plastering.
5. Get the innovative methods of construction by using the latest technology.

Subject: Surveying & Geomatics - C13PC2

1. Calculate angles, distances and levels, Identify data collection methods and prepare field notes.
2. Understanding the working principles of survey instruments, estimate measurement errors and apply corrections.
3. Interpret survey data and Compute Areas and Volumes.
4. Measure horizontal, vertical, and zenith angles with a transit, theodolite and total station instruments.

5. Relate the knowledge on Surveying to the new frontiers of science like Hydrographic surveying, Electronic Distance Measurement, Global Positioning System, Photogrammetry and Remote Sensing.

Subject: Strength of Materials – I - C13PC3

1. Analyze the statically determinate structures.
2. Determine the stresses and strains in the members subjected to axial forces and bending forces.
3. Evaluate shear forces and bending moments.
4. Evaluate the slope and deflection of beams subjected to loads.
5. Determine the principal planes, stresses and strains in structural members.

Subject: Fluid Mechanics - C13PC4

1. Apply conservation laws to derive governing equations of fluid flows.
2. Compute hydrostatic and hydrodynamic forces.
3. Analyze and design simple pipe systems.
4. Apply principles of dimensional analysis to design experiments.
5. Compute drag and lift coefficients.

Subject: Computer Aided Drawing Lab - CESCA1

1. Draw the 2D building drawing.
2. Draw reinforcement detailing of various structural elements.
3. Draw various steel structural members.

Subject: Surveying Lab – I - C13PC5

1. Draw plans & maps to determine the areas before taking up any Civil Engineering works.

Subject: Strength of Materials Lab - C13PC6

2. Conduct tension test on Materials like steel etc.
3. Conduct compression tests on spring, wood and concrete.
4. Conduct flexural and torsion tests to determine elastic constants.
5. Determine hardness and impact strength of metals.

Subject: Cultural Activity - MC003

SEMESTER –IV

Subject: Probability & Statistics - CBSM3

1. Random variables and various discrete and continuous probability distribution and their properties.

2. Calculate interval estimations of Mean and Proportion of large samples.
3. Make important decisions s for few samples which are taken from a large data.
4. Calculate Mean and Proportion and to make important decisions from large samples which are taken from normal populations.
5. Test the hypothesis and give the inference to the given data.
6. The statistical methods of studying data sample.

Subject: Engineering Geology – C14PC1

1. Understand weathering process and mass movements.
2. Distinguish geological formations.
3. Identify geological structures and processes for rock mass quality.
4. Identify subsurface information and groundwater potential sites through geophysical investigations.
5. Apply geological principles for mitigation of natural hazards and select sites for dams and tunnels.

Subject: Strength of Materials – II - C14PC2

1. Determine stresses in the members subjected to Torsion.
2. Analyze columns and struts.
3. Understand the concept of direct and bending stresses.
4. Analyze and design shafts, springs, thin and thick cylinders.
5. Understand the concept of unsymmetrical bending.

Subject: Hydraulics & Hydraulic Machinery - C14PC3

1. Understand the concepts o channel flows.
2. Compute flow profiles in channel transitions and analyze hydraulic transients.
3. Under the concepts of Hydrodynamic force of jets.
4. Design the working proportions of hydraulic machines.

Subject: Structural Analysis – 1 - C14PC4

1. Analyze Perfect, Imperfect And Redundant Frames.
2. Formulate Equilibrium and compatibility equations for structural members
3. Analyze one dimensional and two dimensional problems using classical methods.
4. Analyze indeterminate structures.
5. Analyze structures for gravity loads, moving loads and lateral loads.

Subject: Concrete Technology - C14PC5

1. Identify Quality Control tests on concrete making materials.
2. Understand the behaviour of fresh and hardened concrete.
3. Design concrete mixes as per IS and ACI codes.
4. Understand the durability requirements of concrete.
5. Understand the need for special concretes.

Subject: Surveying Lab – II - C14PC6

Perform surveying on any civil engineering works:

1. Determine of area using total station
2. Traversing using total station
3. Contouring using total station
4. Determination of remote height using total station
5. Stake out using total station 6. Determination of Distance, gradient using total station
6. Differential height between two inaccessible points using total station
7. Curve setting using total station
8. Resection using total station
9. Setting out works for buildings
10. Setting out works for pipe lines
11. Finding position of stations using G.P.S

Subject: Engineering Geology Lab - C14PC7

1. Identify the various rocks, minerals depending on geological classifications
2. Study of physical properties and identification of minerals referred under theory.
3. Megascopic study of rocks.
4. Microscopic study of rocks.
5. Interpretation and drawing of sections for geological maps showing tilted beds, faults, unconformities etc.
6. Geological Investigation by using electrical resistivity meter.

Subject: Highway Engineering & Concrete Technology Lab - C14PC8

1. Assess the quality of various pavement materials and their suitability in highway construction,.
2. Understand properties of Concrete material.
3. Behavior of Concrete & Properties of fresh & hardened Concrete.

Subject: Video with Social Messages - MC004

SEMESTER V

Subject : Fundamentals Of Management- CHSM2

1. Understand the Significance of Management in their Profession.

2. Understand the Various Management Functions like Planning, Organizing, Staffing,

Leading, Motivation and Control aspects.

3. Can explore the Management Practices in their domain area.

Subject : Structural Analysis-II – C15PC1

1. Apply the Methods of Indeterminate Truss Analysis.
2. Demonstrate the Behavior of Arches and their Methods of Analysis.
3. Analyze the Frames by Slope Deflection and Moment Distribution Methods.

4. Analyze Multi-storey Frames subjected to Gravity Loads and Lateral Loads.

5. Demonstrate the Concepts of Qualitative Influence Line Diagram (ILD) for Continuous Beams and frames.

Subject : Design of Reinforced Cement Concrete Structures – C15PC2

1. Design the Reinforced Concrete L and T beam sections using Limit State Design.

2. Design of Reinforced Concrete Canopy and Simply Supported, Continuous Beams.

3. Design the Reinforced Concrete Columns.

4. Design of One way, two way Slab and Continuous Slab.

5. Design Footings: Isolated, Square, Rectangular and Circular, Combined.

Subject : Soil Mechanics – C15PC3

1. To understand the Mechanism of Behavior of Soil for different loads.

2. Determine Properties of Soil.

3. Understand Various Stresses and their Distribution in Soil and Other Engineering Properties of Soil.

4. Understand Shear Strength of Soil and Various Techniques for Improving the Shear Strength.

Subject: Transportation Engineering – C15PE4

1. Carry out Surveys involved in Planning and Highway alignment.

2. Design the Geometric Elements of Highways and Expressways.

3. Carryout Traffic Studies and implements Traffic Regulation and Control Measures and Intersection Design.

4. Characterize Pavement Materials.

5. Design Flexible and Rigid Pavements as per IRC.

Subject : Construction Equipment & Materials – C15PE4

1. Manage the equipment, Cost Control and Maintenance of a Project.

2. Identify and Understand the Working Principle of Earthwork Equipment.

3. Identify and understand the working of Various Equipment for Different Construction Processes.

4. Identify and understand the Working Principle of Material Handling Equipment.

5. Understand the Working of Aggregate Production and Concreting Equipment.

Subject : Railway Engineering – C15PE4

1. Understand the Importance of Railway Infrastructure Planning and Design.

2. Identify the factors Governing Design of Railway Infrastructures.

3. Maintenance of the Railway Track and Signal System for Safe Operations of Railways.

4. Safe Installation and Operations of Railway Track and Signaling System.

5. Maintenance of the Railway Track and Infrastructure.

Subject : Environmental Impact Assessment – CESEA1

1. To Understand Environmental Problems arising due to Engineering and Technological

Activities and the Science behind those Problems.

2. To Analyze and Mitigate the Environmental and Social Impacts of Developmental Projects.

3. To Apply EIA Standards for Social Impacts of Developmental Projects.

4. To Evaluate a Suitable Method for Mathematical Models for Impact Prediction.

Subject : Fluid Mechanics & Hydraulic Machinery Lab – C15PC5

1. Determine for Orifice meter and Venturimeter.

2. Test the Performance of Pumps and Turbines.

3. Determine Energy Loss in Hydraulic Jump.

Subject : Soil Mechanics Lab – C15PC6

1. Determine the Various Properties of Soils by using Different Lab Tests.

2. Determine the Index Properties of Soil and classify them.

3. Determine Compaction & Consolidation of Soils.

4. Determine Permeability and Shear Strength Characteristics of Soil.

SEMESTER VI

Subject: Environmental Engineering – C16PC1

1. Assess Characteristics of Water and Wastewater and their Impacts.

2. To know about the Layouts, Principles of Treatment Nits and Filters

3. Estimate Quantities of Water and Waste Water and Plan Conveyance Components.

4. Design Components of Water and Wastewater Treatment Plants.

5. Be Conversant with issues of Air Pollution and Control.

Subject: Design of Steel Structures – C16PC2

1. Design Bolt and Weld Connections.

2. Design Tension and Compression Members.

3. Design Beams and Built-up Sections.

4. Design of Roof Trusses.

5. Design of Plate Girders and Roof Trusses.

Subject : Water Resource Engineering-1 – C16PC3

1. Analyze Hydro-Meteorological Data.

2. Estimate Abstractions from Precipitation.

3. Compute Yield from Surface and Subsurface Basins.

4. Develop Rainfall-Runoff Models. -

5. Formulate and Solve Hydrologic Flood Routing Models.

6. Estimate Runoff, Design Discharge from Catchment.

Subject : Infrastructure Planning And Management – C16PE4

1. Recognize the need to Plan, Manage and Maintain Infrastructure Projects at a High Level.

2. Demonstrate an Understanding of Reliability Theory.

3. Explain the Principles of Reliability Engineering and Reliability Engineering Processes.
4. Identify and be able to use Mathematical Tools and Techniques Commonly used in Systems Analysis.
5. Develop a System Engineering Management Plan for Practical Applications.

Subject : Remote Sensing & Geographic Information System – C16PE4

1. Understand the Concepts and Principles of Aerial Photogrammetry and Compute Heights of
the Objects using Relief Displacement and Parallax.
2. Understand the Principles and Basic Concept of Remote Sensing and GIS and its
Applications; know different types of Data Representations in GIS.
3. Understand the Map Projections and Coordinates Systems.
4. Understand the Application of Vector and Raster Data structures to the Real World.
5. Understand the Importance of Source Map and On-screen Digitization.

Subject : Solid And Hazardous Waste Management – C16PE4

1. To Understand Environmental Problems Arising due to Improper Disposal of Solid Waste.
2. To Analyse and Mitigate the Environmental Issues due to Hazardous Waste Management.
3. To Apply Standard Methods for Collecting, Handling and Safe Disposal of Biomedical and
E-Waste.
4. To Know the Appropriate Method for Solid Waste Collection, Transportation,
Redistribution and Disposal.
5. To Evaluate an Alternate Technology to Reduce the Impact of Solid Waste in the
Environment.

Subject : Advanced English Communication Skills Lab – CHSE3

1. Acquire Vocabulary and use it contextually.
2. Listen and Speak Effectively.
3. Develop Proficiency in Academic Reading and Writing.
4. Increase Possibilities of Job Prospects.
5. Communicate Confidently in Formal and Informal Contexts.
6. Develop Interpersonal Communication Skills.

Subject : Computer Aided Design And Drawing Lab – C16PC6

1. Detailing of Reinforcement in Beams.
[i] Cantilever [ii] Simply supported [iii] Continuous
2. Detailing of Reinforcement in Columns
[i] Square [ii] Rectangular [iii] Circular
3. Detailing of Reinforcement in RCC Isolated Footings.
[i] Square [ii] Rectangular [iii] Combined Footing
4. Detailing of Reinforcement in RC One-way and Two-way Slabs.
5. Detailing of Reinforcement in RC Dog-legged Staircases / Open Well Staircases.
6. Draw a Layout of Structural Details for a Building - Columns Layout & Center Line
Drawing.

7. Draw a Layout of Structural Details for a Building - Footings Layout.

8. Draw a Layout of Structural Details for a Building - Beams Layout.

9. Draw a Layout of Structural Details for a Building - Slab Layout.

10. Detailing of Reinforcement in RC Retaining Wall.

11. Detailing of Reinforcement in RC Irrigation Canal.

12. Draw Water Supply Network Diagram / Pipe Layout in Discrete Areas.

SEMESTER VII

Subject : Estimation & Costing - B17PC1

1. The students will get a diverse knowledge of estimating, costing.

2. The Professional practice, which will be use full in tackling real life problems.

3. The students will be able to understand the procedure to carry out the estimation and steps to prepare reports of construction works.

4. The students will learn the purpose and importance of valuation.

5. The students will get a diverse knowledge of bar bending schedules in real life problems.

Subject : Water Resources Engineering-II - B17PE2

1. To know the types of reservoirs, zones of storages of a reservoir.

2. Know about the merits and demerits of dams, factor effecting selection of dams, gravity dams. earth dams, canals, and spillways.

3. The causes of failure of the dams, canals and spillways.

4. The design of reservoir, canals, diversion; storage head works by the Bligh's and Khosla's theory.

5. Understand about the types of fall in canals and its application which have designed in the all cases.

Subject : Pipeline Engineering - B17PE2

1. Understand the key steps in a pipeline's lifecycle

2. Understand the types of materials and appurtenances required.

3. Understand the selection of route, surveying and laying out of pipeline

4. Understand the design and construction of pipe line.

5. Understand the installation, management and maintenance of pipes.

Subject : Ground Water Development & Management - B17PE2

1. Estimate aquifer parameters and yield of wells.

2. Analyse radial flow towards wells in confined and unconfined aquifers.

3. Design wells and understand the construction practices.

4. Interpret geophysical exploration data for scientific source finding of aquifers.

5. Determine the process of artificial recharge for increasing groundwater potential.

6. Take effective measures for controlling saline water intrusion.

7. Apply appropriate measures for groundwater management.

Subject : Air And Noise Pollution - B17PE3

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1. An understanding of the nature and characteristics of air pollutants, noise pollution and basic concepts of air quality management
2. Ability to identify, formulate and solve air and noise pollution problems
3. Ability to design stacks and particulate air pollution control devices to meet applicable laws.

Subject : Environmental Impact Assessment – B17PE3
1. To Understand environmental problems arising due to engineering and technological activities and the science behind those problems
2. To Analyse and mitigate the environmental and social impacts of developmental projects.
3. To apply EIA standards for Social impacts of developmental projects
4. To evaluate a suitable method for Mathematical models for Impact prediction.

Subject : Solid And Hazardous Waste Management – B17PE3
1. To Understand environmental problems arising due to improper disposal of solid waste
2. To Analyse and mitigate the environmental issues due to hazardous waste management.
3. To apply standard methods for collection handling and safe disposal of biomedical and E-waste
4. To know the appropriate method for solid waste collection, transportation, redistribution and disposal.
5. To evaluate a alternate technology reduce the impact of solid waste in the Environment.

Subject : Remote Sensing & Geographic Information System – B17PE4
1. After completing this course the student will be able to
2. Understand the concepts and principles of Aerial Photogrammetry and Compute heights of the objects using relief displacement and parallax.
3. Understand the principles and basic concept of remote sensing and GIS and its applications; know different types of data representations inGIS.
4. Understand the map projections and coordinates systems.
5. Understand the application of vector and raster data structures to the real world.
6. Understand the importance of source map and on screen digitization.

SEMESTER VIII

Subject : Traffic Engineering & Management – B18PE1
1. Analysis Traffic Problems and Plan For Traffic Systems Various Uses
2. Design Channels, Intersections, Signals and Parking Arrangements
3. Students will be able to study about the traffic andcongestions.
4. Implement traffic regulations and control measures at intersections.
5. To minimize the road accident rate by using traffic monitoring systems.
6. To facilitate good parking facilities.
7. Develop Traffic Management Systems.

Subject : Railway Engineering – B18PE1

1. Understand the importance of railway infrastructure planning and design.
2. Identify the factors governing design of railway infrastructures.
3. Maintenance of the railway track and signal system for safe operations of railways.
4. Safe installation and operations of railway track and signalling system.
5. Maintenance of the railway track and infrastructure.

Subject : Pavement Design, Construction And Maintenance - B18PE1

1. Understand various factors and stresses in pavements.
2. Know the properties of different materials used inpavements.
3. To design flexible and rigid pavements based on IRC guidelines.
4. Further they know various techniques to evaluate performance of pavements.
5. Maintenance of pavements based on environmental impacts.

Subject : Construction Project Planning & Management - B18PE2

1. Understand the Process of planning and management.
2. Understand the construction stages and network techniques.
3. Apply the concept of resource planning scheduling.
4. Formulate and execute various contract documents and tenders.
5. Understand the labour safety and financial aspects of accidents.

Subject : Bridge Engineering (PE-VI) - B18PE2

1. To develop an understanding of and appreciation for basic concepts in proportioning and design of bridges in terms of aesthetics, geographical location and functionality.
2. Understand the load-carrying capacity of various types of bridges with different kinds of loads.
3. To understand and appreciate significance of mechanical engineering in different Fields of engineering.
4. To carry out a design of bridge starting from conceptual design, selecting suitable bridge, geometry to sizing of its elements
5. To understand the load flow mechanism and identify loads on bridges.

Subject : Rehabilitation And Retrofitting - B18PE2

1. Understand the causes and prevention deterioration of structures.
2. Interpret the types of damages and understand their mechanism.
3. Categorize the causes and prevention of corrosion in steel Reinforcement and fire induced damages
4. Examine to inspect and assess the structures using techniques of visual inspection and NDT.
5. Make use of the latest health monitoring and building instrumentation methods.

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DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING
2022-23

PROGRAM OUTCOMES (POs):

Engineering Graduates will be able to:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

2. **Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

4. **Conduct investigations of complex problems:** Use research-based knowledge andresearch methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

6. **The engineer and society:** Apply reasoning informed by the contextual knowledgeto assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

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DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING
2022-23

10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

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DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING
2022-23

PROGRAM SPECIFIC OUTCOMES (PSOs):

PSO1: Ability to apply the acquired knowledge of Electronics and Communication Engineering in design and development, in areas of VLSI and Image Processing.

PSO2: Analyze and solve the complex Electronics and Communication Engineering problems using state of art hardware and software tools.

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DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

2022-23

Subject Name: Linear Algebra, Calculus &
Ordinary Differential Equations

Subject Code: D1BSM1

Course Outcomes:

After learning the contents of this course the student must be able to

1. Discuss the matrix representation of asset of linear equations and to analyses the solution of the system of equations.
2. Reduce the quadratic form to canonical form using orthogonal transformation.
3. Identify whether the given DE of first order is exact or not.
4. Can find applications of first order ODE.
5. Solve higher differential equation and apply the concept of differential equation to real world problems.
6. Evaluating double integrals and applying the moto compute the areas of regions

Subject Name: Engineering physics

Subject Code: D1BSEP1

Course Outcomes:

On completion of the course student will able to

1. Analyze the concepts of quantum mechanics and visualize the difference between conductor, semiconductor, and un insulated ruby classification of solids.
2. Identify the role of semiconductor devices in science and engineering applications.
3. Explore the fundamental properties of dielectric and energy materials for their applications.
4. Knowing the concepts related to magnetic and super conducting materials for different engineering applications.
5. Explore the various aspects of lasers and optical fiber and their applications in diverse fields.

Subject Name: Fundamentals of Electrical Engineering

Subject Code: D1ESFEE

Course Outcomes:

After this course, the student will be able to

1. Understand and analyze DC, AC circuits using basic principles.
2. Analyze and evaluate electrical circuits using various theorems.
3. Understand the characteristics and performance of Electrical Machines and Transformers.
4. Understand the applications of various electrical installations.

Subject Name: C Programming For Problem Solving

Subject Code: D1ESCP1

Course Outcomes:

After this course, the student will be able to

1. Learn the taxonomy of computers and C fundamentals
2. Demonstrate arrays and functions to write c programming
3. Write C programs using pointers and string
4. Analyze and write C programs using structures and unions
5. Develop C programs for various applications using file I/O functions.

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DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

2022-23

Subject Name: Engineering Physics Lab

Subject Code: D1BSEP2

Course Outcomes:

After this course, the student will be able to

1. Identify the V-I characteristics of Laser diode.
2. Evaluate the numerical aperture and bending loss of a given optical fibre.
3. Analyze the V-I characteristics of LED and photo diode devices.
4. Identify the type of semiconductor by using Hall Effect experiment.
5. Measure the Plank's constant using Photocell.

Subject Name: Fundamentals of Electrical Engineering Lab

Subject Code: D1ESFEL

Course Outcomes:

After this course, the student will be able to

1. Apply various laws to solve electrical networks.
2. Apply network theorems to solve complex electrical networks.
3. Analyze single phase AC circuits.
4. Evaluate the performance of different types of Electrical machines and single phase transformer by conducting various tests.
5. Under stand and analyze electrical installations using different lamp controlled methods, stair case wiring a different wiring connection.

Subject Name: C Programming For Problem Solving Lab

Subject Code: D1ESCP3

Course Outcomes:

After this course, the student will be able to

1. Design and test programs to solve mathematical and scientific problems.
2. Writes structured programs using control structures and functions.

Subject Name: It Workshop

Subject Code: D1ESITW

Course Outcomes:

After this course, the student will be able to

1. Apply knowledge for computer assembling and software installation.
2. Solve the trouble shooting problems.
3. Apply the tools for preparation of PPT, Documentation and budget sheet
4. Create standard documents and research documents using Latex.
5. Create project plans.

Subject Name: Engineering Workshop

Subject Code: D1ESEW1

Course Outcomes:

After this course, the student will be able to

1. Design and model different prototypes in the carpentry trade such as Cross lap joint, Dove tailoint.
2. Develop and model various basic prototypes in the trade of fitting such as Straight and L fit.

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DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

2022-23

3. Construct various basic prototypes in the trade of Tin smithy such as rectangular tray, Scoop.
4. Inspect various basic house wiring techniques such as connecting one lamp with one switch,
5. Connecting two lamps with one switch, Series wiring.
6. Build various basic prototypes in the trade of Welding such as Lap joint, Butt joint

Subject Name: Mathematical Transforms

Subject Code: D2BSM3

Course Outcomes:

After this course, the student will be able to

1. Select and use the appropriate shift theorems in finding Laplace and inverse Laplace transforms.
2. Use Laplace transforms techniques for solving differential equations.
3. One will be able to find the expansion of a given function by Fourier series.
4. Evaluating any periodic function in term of sines and cosines.
5. Evaluating a non-periodic function in terms of sine and cosine transforms.
6. Understanding and apply Z-transforms, Inverse Z-transforms to solve Difference equations.

Subject Name: Engineering Chemistry

Subject Code: D2BSEC1

Course Outcomes:

After this course, the student will be able to

1. Students will acquire the basic knowledge of conductance in Metals and Bond Structures.
2. The students are able to understand the basic properties of water and its usage in domestic and industrial purposes.
3. They will acquire the Knowledge of chemistry in Batteries.
4. They can learn the fundamentals and general properties of polymers and other engineering materials.
5. They can predict potential applications of chemistry and practical utility in order to become good engineers and entrepreneurs

Subject Name: Electronic Devices & Circuits

Subject Code: D2ESED1

Course Outcomes:

After this course, the student will be able to

1. Acquire the knowledge in semiconductor materials and knows the complete internal structure of PN junction its capacitances and resistances.
2. Design the circuits for the conversion of AC to DC Voltages.
3. Acquire knowledge in the structure of Transistor (different types, operation, characteristics and applications)
4. Analyze the dc bias circuitry of BJT.
5. Acquire knowledge in the structure of, FET, MOS (different types, operation, characteristics and applications)

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DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

2022-23

Subject Name: English For Skill Enhancement   **Subject Code: D2HSE1**
Course Outcomes:
After this course, the student will be able to

1. Understand the importance of vocabulary and sentence structures.
2. Choose appropriate vocabulary and sentence structures for their oral and written communication.
3. Demonstrate their understanding of the rules of functional grammar.
4. Develop comprehension skills from the known and unknown passages.
5. Take an active part in drafting paragraphs, letters, essays, abstracts, précis and reports in various contexts.
6. Acquire basic proficiency in reading and writing modules of English.

Subject Name: Computer Aided Engineering Graphics   **Subject Code: D2ESCEG**
Course Outcomes:
After this course, the student will be able to
1. Apply computer aided drafting tools to create 2D and 3D objects
2. Sketch conics and different types of solids
3. Appreciate the need of Sectional views of solids and Development of surfaces of solids
4. Read and interpreting engineering drawings
5. Conversion of orthographic projection in to isometric view and vice versa manually and by using computer aided drafting

Subject Name: Engineering Chemistry Lab   **Subject Code: D2EBSEC2**
Course Outcomes:
After this course, the student will be able to
1. The concepts of error and its analysis and can also develop the skills to tabulate the experimental data and derive valid conclusions.
2. Hands on experience in performing the electro-analytical techniques such as conduct ometry, potentiometry and pH metry.
3. The ability to prepare polymers.
4. Estimation of Surface tension and viscosity of Lubricant oil.

Subject Name: Electronic Devices & Circuits Lab   **Subject Code: D2ESED2**
Course Outcomes:
After this course, the student will be able to
1. Design different electronic circuits for different applications using devices like Diodes, Transistors, etc.
2. Design circuits which can convert AC to DC.
3. Design various transistor biasing circuits.

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DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

2022-23

Subject Name: English Language & Communication Skills Lab
Subject Code: D2HSE2
Course Outcomes:

After this course, the student will be able to
1. Understand the nuances of English language through audio- visual experience and group activities.
2. Neutralize their accent for intelligibility.
3. Speak with clarity and confidence which in turn enhances their employability skills.

Subject Name: Applied Python Programming Lab
Subject Code: D2ESPP4
Course Outcomes:

After this course, the student will be able to
1. Build basic programs using fundamental programming constructs
2. Write and execute python codes for different applications
3. Capable to implement on hardware boards

Subject Name: Complex Analysis & Vector Calculus
Subject Code: CBSM15
Course Outcomes:

After learning the contents of this paper the student must be able to
1. Analyze the complex functions with reference to their analyticity.
2. Evaluate integrals using Cauchy's integral theorem, formula and finding the Taylor and Laurent's series expansion of complex functions.
3. Solve problems on Residues using different methods.
4. Evaluate real integrals.
5. Compute derivatives of vector valued functions, gradient function.
6. Evaluate the line- surface and volume integrals and converting them from one to another.

Subject Name: Digital Logic Design
Subject Code: CESDL1
Course Outcomes:

Upon completion of the Course, the students will be able to
1. Convert numeric information in different forms, e.g. different bases, signed integers, various codes such as ASCII, Gray, and BCD.
2. Realize simple Boolean expressions using the theorems and postulates of Boolean algebra and to minimize combinational functions.
3. Design and analyze of small combinational circuits and to use standard combinational functions/building blocks to build larger more complex circuits.
4. Design of sequential logic circuits and synthesizing of threshold functions.
5. Design and analyze small sequential circuits and devices and to use standard sequential functions/building blocks to build larger more complex circuits.

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DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

2022-23

Subject Name: Electronic Circuit Analysis

Subject Code: C43PC1

Course Outcomes:

Upon completion of the Course, the student's will be able to:

1. Design and analyze BJT small signal amplifier circuits and applying the biasing techniques learnt earlier.
2. Obtain the required over all specifications like Gain, Bandwidth, etc. analyze the transistor at very high frequencies.
3. Design and analyze small signal amplifier circuits applying the FET biasing techniques.
4. Utilize the Concepts of negative feedback to improve the stability of amplifiers and Positive feedback to generate sustained oscillations.
5. Design and realize different classes of Power Amplifiers and tuned amplifiers use able for audio and Radio applications.

Subject Name: Signals And Systems

Subject Code: C43PC2

Course Outcomes:

At the end of this course students will be able to

1. Acquire the knowledge about types of signals, classification of signals & systems, orthogonality.
2. Analyze Fourier Representation of Continuous Time periodic and periodic signals.
3. Analyze waveform synthesis using Laplace transforms, Sampling and Reconstruction of signals.
4. Investigate the convolution and correlation of signals.
5. Realizes the system reliability, transfer function using state space.

Subject Name: Network Analysis

Subject Code: C43PC3

Course Outcomes:

After this course, the student will be able to

1. Illustrate about network topology.
2. Obtain the transient and steady-state response of electrical circuits.
3. Analyze circuit analysis using Laplace transform.
4. Discuss about two port networks.
5. Design network filters.

Subject Name: Digital Logic Design Lab

Subject Code: CESDL2

Course Outcomes:

On completion of this lab course the students will be able to:

1. Acquires the knowledge of 74XX IC's.
2. Design various combinational & sequential circuits using various Digital ICs.
3. Acquires the knowledge of differentiating between Linear and Digital IC's.
4. Acquires the knowledge of demonstrating by designing digital circuits.

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DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

2022-23

Subject Name: Electronic Circuit Design Lab
Course Outcomes:

Subject Code: C43PC4

Upon completion of the subject, students will be able to

1. Design of Single & Multi stage amplifiers.
2. Design of Power and Tuned amplifiers.
3. Design of Feedback and Oscillator circuits.
4. Analyze the different types of FET Amplifiers.

Subject Name: Electronic Circuit Simulation Lab
Course Outcomes:

Subject Code: C43PC5

Upon completion of the subject, students will be able to

1. Analyze Single & Multi stage amplifiers.
2. Analyze Power and Tuned amplifiers.
3. Analyze Feedback and Oscillator circuits.
4. Analyze the different types of FET Amplifiers.

Subject Name: Basic Simulation Lab
Course Outcomes:

Subject Code: C43PC6

1. Understanding of MATLAB tool.
2. To analyze various signals and sequences in MATLAB including operations.
3. To verify Wiener-Khintchine Relations and Sampling Theorem.

Subject Name: Probability Theory And Stochastic Processes
Course Outcomes:

Subject Code: C44PC1

Upon completing this course, the student will be able to

1. Understand the basics of probability theory.
2. Understand the concepts of Random Variables.
3. Understand the operations of Random Variables.
4. Determine the Temporal Characteristics of Random Signals.
5. Determine the Spectral Characteristics of Random Signals.

Subject Name: Analog Communications
Course Outcomes:

Subject Code: C44PC2

After completion of this course the student will be able to:

1. Learn the concept of modulation.
2. Analyze and design various Modulation and Demodulation analog systems.
3. Understand the characteristics of angle modulation techniques.
4. Study of signal to Noise Ration (SNR) performance of various Analog Communication systems.
5. Analyze and design the various Pulse Modulation Systems.
6. Understand the concepts of Multiplexing.

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DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

2022-23

Subject Name: Pulse And Digital Circuits

Subject Code: C44PC3

Course Outcomes:

At the end of the course, the student will be able to:

1. Understand the applications of diode as integrator, differentiator, clippers, and Clampers.
2. Learn various switching devices such as diode, transistor, SCR. Difference between logic gates and sampling gates.
3. Design multivibrators for various applications, synchronization techniques and sweep circuits.
4. Realizing logic gates using diodes and transistors.
5. Understanding of time and frequency domain aspects.
6. Importance of clock pulse and its generating techniques

Subject Name: Linear IC Applications

Subject Code: C44PC4

Course Outcomes:

Upon completing this course, the student will be able to

1. A thorough understanding of operational amplifiers with linear integrated circuits.
2. Attain the knowledge of functional diagrams and applications of IC 555 and IC565.
3. Acquire the knowledge about the Data converters.
4. Design different ADC's.
5. Design different DAC's.

Subject Name: Electromagnetic Theory and transmission Lines

Subject Code: C44PC5

Course Outcomes:

Upon completion of the Course, the students will be able to:

1. Analyze the electric fields due to different charge distributions and analyze the electric fields indifferent mediums.
2. Distinguish between the static and time-varying fields, establish the corresponding sets of Maxwell's Equations and Boundary Conditions, and use them for solving engineering problems.
3. Analyze the EM wave propagation and attenuation in various media and analyze the importance of pointing theorem.
4. Determine the Transmission Line parameters for different lines characterize the distortions and estimate the characteristics for different lines.
5. Choose smith chart to design transmission lines, to find the reflection coefficient for given impedance and vice versa.
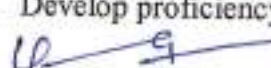
Subject Name: Advanced English Communication Skills Lab

Subject Code: CHSE3

Course Outcomes:

Students will be able to:

1. Acquire vocabulary and use it contextually.
2. Listen and speak effectively.
3. Develop proficiency in academic reading and writing.

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TKR COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

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DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

2022-23

4. Increase possibilities of job prospects.
5. Communicate confidently in formal and informal contexts.
6. Develop interpersonal communication skills.

Subject Name: Analog Communications Lab   Subject Code: C44PC6
Course Outcomes:

Upon completion of the lab, students will be able to:

1. Design Analog Communication systems to meet desired needs.
2. Convert Analog Signals to digital while satisfying certain specifications.
3. Analyze the Signal Transmission and Receiving fundamental concepts.
4. Describe the operation of multiplexing techniques.

Subject Name: Pulse And Digital Circuits Lab   Subject Code: C44PC7
Course Outcomes:

Upon completion of the Lab, students will be able to:

1. Design RC circuits.
2. Design Multivibrators for various Applications.
3. Design Time Base Generators and Relaxation Oscillators.
4. Design different types of Digital Circuits by using Logic Gates and Flip-Flops

Subject Name: Linear IC Applications Lab   Subject Code: C44PC8
Course Outcomes:

Upon the completion of Lab, student will be able to:

1. Acquires the knowledge of operational amplifier (741).
2. Design circuits using operational amplifiers for various applications.
3. Design circuits using IC 555 and IC 565 for various applications.
4. Design circuits using voltage regulators for various applications.
5. Design circuits using active filters.

Subject Name: Business Economics and Financial Analysis   Subject Code: CHSM1
Course Outcomes:

After learning the contents of this course the student must be able to

1. Analyze the total structure of the business and able to identify and classify the
1. Different types of business entities.
2. Asses the demand and supply analyses with the help of various measures and types of Elasticity of demand.
3. Infer the knowledge about production and cost analysis for product and services.
4. Interpret the fundamental concepts related to financial accounting.
5. Predict the financial position by analyzing the financial statement of the company through various ratios.

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DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

2022-23

Subject Name: Control Systems   **Subject Code::C45PC1**

Course Outcomes:

After learning the contents of this Course the student must be able to

1. Understand the System performance by selecting a suitable Controller and/or a Compensator for a specific application
2. Apply various Time Domain techniques to assess the system performance
3. Apply various Frequency Domain techniques to assess the system performance
4. Apply various control strategies to different applications
5. Test system Controllability and Observability using State space representation and applications of state space representation to various systems.

Subject Name: Digital Communications   **Subject Code: C45PC2**

Course Outcomes:

After learning the contents of this course the student must be able to

1. Analyze the basic digital modulation techniques such as PCM, DM etc., and understand the concepts of sampling.
2. Explain the concepts of different Shift Keying techniques.
3. Classify the basics of information theory and analyze the error performance, design optimum receivers for digital modulation techniques.
4. Interpret about different error detection and correcting codes like block codes, cyclic codes and convolution codes.
5. Analyze the performance of Spread Spectrum and Noise

Subject Name: Microprocessor and Microcontrollers   **Subject Code: C45PC3**

Course Outcomes:

After learning the contents of this course the student must be able to

1. Acquire the knowledge of internal architecture, organization of 8086 processor and can develop assembly language programming.
2. Analyze internal architecture, memory organization of 8051 controller and can develop programming.
3. Construct interfacing techniques to 8086 and 8051 and define various serial communication standards.
4. Interpret the internal architecture and organization of ARM processor, and can develop programming.
5. Build the knowledge of the internal architecture and organization of advanced ARM Processors.

Subject Name: Digital Design through Verilog HDL   **Subject Code: C45PE5-I**

Course Outcomes:

After learning the contents of this course the student must be able to

1. Describe, design, simulate, and synthesize computer hardware using the Verilog hardware description language.
2. Describe the role of hardware description language (HDL) in design flows for FPGA and

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2022-23

ASIC with a historical development of the Verilog HDL.
3. Develop program codes for structural, behavioral and data flow modeling of combinational and sequential logic using Verilog HDL in any problem identification formulation and solution.
4. Complete tasks and assignments effectively as instructed with the use of modern technology through research and case studies.
5. Interpret and Implement designs using the advanced features of Verilog HDL and be able to write code effectively.

Subject Name: Image Processing & Pattern Recognition   Subject Code: C45PE5-II
Course Outcomes:

After learning the contents of this course the student must be able to

1. Understand Basics of image formation and transformation using sampling and quantization. Analyzes image enhancement techniques in both spatial and frequency domains.
2. Estimate how to restore the degraded image and finds tradeoffs between various filters to image restoration techniques. Apart from that evaluates the need for image compression also to evaluate the basic compression algorithms.
3. Ability to analyze image using different morphological techniques also understands the concepts of various Image segmentation.
4. Recognizes various representation and description techniques used in image processing.
5. Understands the fundamentals of Pattern recognition and classification methods to choose an appropriate features

Subject Name: Introduction to Embedded Systems   Subject Code: C45PE5-III
Course Outcomes:

After learning the contents of this course the student must be able to

1. Identify the constraints and challenges of an Embedded System design
2. Understand the custom single purpose processors
3. Understand the general purpose processors
4. Get familiarized with state machines and models
5. Develop simple examples of embedded system

Subject Name: Optical Fiber Communications   Subject Code: C45PE5-IV
Course Outcomes:

After learning the contents of this course the student must be able to

1. Summarize the importance, introductions and the basic elements, of optical fiber transmission link, fiber modes configurations and structures.
2. Interpret the different kind of losses, signal distortion in optical wave guides and other signal degradation factors.
3. Demonstrate the ability to design a system, with the knowledge of optical components as per needs and specifications.
4. Co-relate various Optical detectors and its performance.

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2022-23

5. Design Optical System and measure its characteristics.

Subject Name: Digital Communications Lab   Subject Code: C45PC6
Course Outcomes:

After learning the contents of this course the student must be able to
1. Understand basic theories of Digital communication system in practical.
2. Design and implement different Pulse modulation and demodulation techniques.
3. Analyze digital modulation techniques.
4. Identify and describe different techniques in modern digital communications, in particular source coding techniques.
5. Perform different multiplexing techniques

Subject Name: Microprocessor and Microcontrollers Lab   Subject Code: C45PC7
Course Outcomes:

After learning the contents of this course the student must be able to
1. Apply the fundamentals of assembly level programming for microprocessors/ microcontrollers.
2. Develop programs on a microprocessor using instruction set of 8086.
3. Develop the assembly level programming using 8051 instruction set.
4. Able to understand how different I/O devices can be interfaced to microprocessor and microcontroller.
5. Develop programs using instruction set of ARM.

Subject Name: Fundamentals of Management   Subject Code: CHSM2
Course Outcomes:

After learning the contents of this course the student must be able to
1. Infer the basic knowledge of management functions, levels and evolution of Management.
2. Ensure the students in decision making problem solving for the issues in corporate in the organization.
3. Acquire the knowledge of entire organization design and structure.
4. Perceive the strategically decision in selection, requirement training and development.
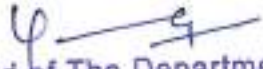5. Enact and impose the qualities of a leader, mentor and coach.

Subject Name: Antennas and Wave Propagation   Subject Code: C46PCI
Course Outcomes:

After learning the contents of this course the student must be able to
1. Explain the mechanism of radiation, distinguish between different antenna characteristic parameters, establish their mathematical relations, and estimate them for different practical cases.
2. Establish the radiation patterns of folded dipole, Yagi-Uda Antenna, Helical
1. Antennas, Horn Antennas, and to acquire the knowledge of their analysis, design and development.

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2022-23

2. Analyze a micro strip rectangular patch antenna and a parabolic reflector antenna.
3. Carry out the Linear Array Analysis, Binomial Arrays and Planar arrays and specify the requirements for microwave measurements.
4. Classify the different wave propagation mechanisms.

Subject Name: Digital Signal Processing   **Subject Code: C46PC2**
Course Outcomes:
After learning the contents of this course the student must be able to
1. Necessity and use of digital signal processing and its application.
2. Analyze Discrete Fourier transform
3. Analyze FIR and IIR digital filters.
4. Applications of Multirate digital signal processing.
5. Acquaintance of DSP processor and its architecture.

Subject Name: Digital IC Design   **Subject Code: C46PE3-I**
Course Outcomes:
After learning the contents of this course the student must be able to
1. Understand the various issues in digital integrated circuits.
2. Acquire knowledge of static and dynamic CMOS inverter.
3. Design of CMOS static and dynamic logics.
4. Acquire knowledge of static and dynamic latches and registers behavior.
5. Design arithmetic building blocks and various memories using CMOS.

Subject Name: Color Image Processing   **Subject Code: C46PE3-II**
Course Outcomes:
After learning the contents of this course the student must be able to
1. Analyze the fundamentals of Color and its applications.
2. Understands different types of color image processing and transformations techniques involved in color images
3. Acquires the knowledge about color image enhancement techniques.
4. Ability to understand the concepts of various color image and edge-base segmentation
5. Understands color image compression procedures.

Subject Name: Advanced Microcontrollers   **Subject Code: C46PE3-III**
Course Outcomes:
After learning the contents of this course the student must be able to
1. The Intel microcontroller architecture and its components
2. The basics of Motorola and PIC controllers
3. The basics of ARM processors
4. The detailed instruction sets of ARM and Thumb.
5. Microcontroller application development tools.

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Subject Name: Telecommunication Switching Systems and Networks   **Subject Code** C46PE3-IV

Course Outcomes:

After learning the contents of this course the student must be able to

1. Analyze different switching methodologies.
2. Differentiate between signaling methods used in Telecommunication Networks
3. Exhibit a good knowledge on data communication networks and ISDN and be able to differentiate LAN, MAN, WAN.
4. Demonstrate an ability to work on various Telecommunication Network concepts.
5. Demonstrate knowledge on modern telecommunication concepts like DSL & SONET.

Subject Name: VLSI Design   **Subject Code:** C46PC4

Course Outcomes:

After learning the contents of this course the student must be able to

1. Acquire qualitative knowledge about the fabrication of MOS transistors.
2. Design layout of any logic circuit with proper design rules.
3. Implement transistor level circuits for equivalent logic circuits.
4. Design sub systems like data, control and memory modules.
5. Implement any logic circuit using various Programmable Logic Devices.

Subject Name: Digital Signal Processing Lab   **Subject Code:** C46PC6

Course Outcomes:

After learning the contents of this course the student must be able to

1. Illustrate various signal processing algorithms.
2. Analyze FIR Filter with specific magnitude and phase requirements.
3. Analyze IIR Filter with specific magnitude and phase requirements.
4. Illustrate the basics of Multi rate signal processing.
5. Analyze digital filters on DSP processors

Subject Name: VLSI Design Lab   **Subject Code:** C46PC7

Course Outcomes:

After learning the contents of this course the student must be able to

1. Simulate various digital circuits.
2. Simulate and synthesize various CMOS circuits.
3. Understand the layout design rules for both static CMOS and dynamic clocked CMOS Circuits.
4. Develop an ability of designing of analog and digital CMOS circuits.
5. Design of Digital VLSI Circuits, stick diagram of circuits.
6. Design Entry & simulation of combinational circuits with test bench & functional verification.
7. Generation of configuration/fuse files for combinational circuits & implementation of the hardware using FPGA.
8. Design a schematic and simple layout for CMOS circuits, parasitic extraction.

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2022-23

9. Be able to complete a significant VLSI design project having a set of objective criteria and design constraints.

Subject Name: Microwave Engineering   **Subject Code:** B47PC1
Course Outcomes:

Having gone through this course covering different aspects of microwave theory and techniques, the students would be able to

1. To analyze completely the rectangular waveguides, their mode characteristics, and design waveguides for solving practical microwave transmission line problems.
2. To distinguish between the different types of waveguide and ferrite components, explain their functioning and select proper components for engineering applications.
3. To distinguish between the methods of power generation at microwave frequencies, derive the performance characteristics of 2-Cavity and Reflex Klystrons, Magnetrons, TWTs and estimate their efficiency levels, and solve related numerical problems.
4. To realize the need for solid state microwave sources, understand the concepts of TEDs, RWH Theory and explain the salient features of Gunn Diodes and ATT Devices.
5. To establish the properties of Scattering Matrix, formulate the S-Matrix for various microwave junctions, and understand the utility of S-parameters in microwave component design.

Subject Name: Professional Ethics   **Subject Code:** B47HS3
Course Outcome:

1. The students will understand the importance of Values and Ethics in their personal lives and professional careers. The students will learn the rights and responsibilities as an employee, team member and a global citizen.

Subject Name: Business Economics and Financial Analysis   **Subject Code:** B47HS4
Course Outcome:

The students will understand

1. The various Forms of Business and the impact of economic variables on the Business.
2. The Demand, Supply, Production, Cost, Market Structure, Pricing and taxes on goods are learnt.
3. The firm's financial position by analyzing the Financial Statements of a Company.

Subject Name: Microwave Engineering Lab   **Subject Code:** B47PC5
Course Outcomes:

1. Gain knowledge and understanding of microwave analysis methods.
2. Be able to apply analysis methods to determine circuit properties of passive/active microwave devices.
3. Know how to model and determine the performance characteristics of a microwave circuit or system using computer aided design methods.

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2022-23

4. Have knowledge of how transmission and waveguide structures and how they are used as elements in impedance matching and filter circuits.

Subject Name: Advanced Technologies Lab
Subject Code: B47PC6
Course Outcomes:

1. Understand the basic Linux commands.
2. Practice basic programs using python.
3. Execute various python programs on Raspberry Pi.
4. Design & develop various IOT applications using basic components on Raspberry Pi

Subject Name: Adhoc Wireless Sensor Networks
Subject Code: B48PE1-I
Course Outcomes:

1. Ability to understand the concept of ad-hoc and sensor networks.
2. Ability to design and implement sensor network protocols.
3. Ability to set up and evaluate measurements of protocol performance in sensor networks.

Subject Name: Biomedical Electronics
Subject Code: B48PE1-II
Course Outcomes:

1. At the end of this course the learner will have good understanding of measuring and monitoring equipment.

Subject Name: Optimization Techniques
Subject Code: B48PE1-III
Course Outcomes:

After completion of this course, the student will be able to

1. Explain the need of optimization of engineering systems
2. Understand optimization of electrical and electronics engineering problems
3. Apply classical optimization techniques, linear programming, simplex algorithm,
4. Apply unconstrained optimization and constrained non-linear programming and dynamic programming
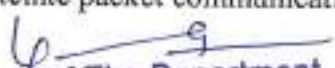5. Formulate optimization problems.

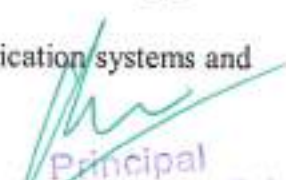Subject Name: Satellite Communications
Subject Code: B48PE2-I
Course Outcomes:

At the end of the course, Students will be able to

1. Understand the historical background, basic concepts and frequency allocations for satellite communication.
2. Demonstrate orbital mechanics, launch vehicles and launchers.
3. Demonstrate the design of satellite links for specified C/N with system design examples.
4. Visualize satellite sub systems like Telemetry, tracking, command and monitoring power systems etc.
5. Understand the various multiple access systems for satellite communication systems and satellite packet communications.

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Subject Name: Design Of Fault Tolerant Systems   **Subject Code: B48PE2-II**
Course Outcomes:

1. To acquire the knowledge of fundamental concepts in fault tolerant design.
2. Design requirements of self check-in circuits.
3. Test pattern generation using LFSR.
4. Design for testability rules and techniques for combinational circuits.
5. Introducing scan architectures.

Subject Name: Embedded Systems   **Subject Code: B48PE3-I**
Course Outcomes:

1. Expected to understand the selection procedure of Processors in the embedded domain.
2. Design Procedure for Embedded Firmware.
3. Expected to visualize the role of Real time Operating Systems in Embedded Systems.
4. Expected to evaluate the Correlation between task synchronization and latency issues.

Subject Name: Radar Systems   **Subject Code: B48PE3-II**
Course Outcomes:
Having gone through this course on Radar Systems, the students would be able to:

1. Explain the working principle of a pulse radar and establish the complete radar range equation, identifying the significance and choice of all parameters involved, and solve numerical problems to establish the radar characteristics.
2. Account for the need and functioning of CW, FM-CW and MTI radars, identifying the complete block diagrams and establishing their characteristics.
3. Illustrate the DLC characteristics, account for the range gated Doppler filter bank, and estimate the MTI radar performance characteristics and limitations.
4. Distinguish between Sequential Lobing, Conical Scan, Monopulse type of Tracking Radars, specify their requirements and compare their characteristic features.
5. Derive the matched filter response characteristics for radar applications and account for correlation receivers to distinguish between different radar displays and duplexers.

Subject Name: Database Management Systems   **Subject Code: B48PE3-III**
Course Outcomes:

1. Demonstrate the basic elements of a relational database management system.
2. Ability to identify the data models for relevant problems.
3. Ability to design entity relationship model and convert entity relationship diagrams into RDBMS and formulate SQL queries on the data.
4. Apply normalization for the development of application software.

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Department of Information Technology

2022-23

Subject Name: LINEAR ALGEBRA AND ORDINARY DIFFRENTIAL EQUATIONS **Subject Code:** D1BSM1

CO1: Discuss the matrix representation of a set of linear equations and to analyses the solution of the system of equations.

CO2: Reduce the quadratic form to canonical form using orthogonal transformation.

CO3: Identify whether the given DE of first order is exact or not.

CO4: Can find applications of first order ODE.

CO5: Solve higher differential equation and apply the concept of differential equation to real world problems.

CO6: Evaluating double integrals and applying them to compute the areas of regions.

Subject Name: APPLIED PHYSICS   **Subject Code:** D1BSAP1

CO1: Summarize the fundamentals of quantum mechanics to understand the quantum physics in the physical world.

CO2: By understand the fundamentals of band theory of solids; students will be able to classify the materials on the basis of energy gap.

CO3: Knowing the physics behind the semiconductors, enables the students to use them in different engineering applications

CO4: Establishing a strong foundation on the different kinds of opto-electronic, dielectric and display materials and paves a way for them to use in at various technical and engineering applications

CO5: Knowledge on fiber optics and quantum information enables the students to apply them in systems like optical communications and advanced quantum communication.

Subject Name: PROBLEM SOLVING USING C PROGRAMMING   **Subject Code:** D1ESCP4
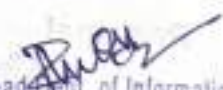
CO1: Write solutions using problem solving techniques and appropriate programming constructs for solving problems

CO2: Develop programs using selection, iteration statements and arrays for a given scenario

CO3: Construct programs using functions & strings for a given application

CO4: Implement programs using pointers, structures & unions for various real time applications

CO5: Write programs using files & preprocessor directives and graphics functions for a given scenario

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Subject Name: BASIC ELECTRICAL ENGINEERING

Subject Code: D1ESBEE

CO1: Understand and analyze DC, AC circuits using basic principles.

CO2: Analyze and evaluate electrical circuits using various theorems.

CO3: Understand the characteristics and performance of Electrical Machines and Transformers.

CO4: Understand the applications of various electrical installations.

Subject Name: COMPUTER AIDED ENGINEERING GRAPHICS

Subject Code: D1ESCEG

CO1: Apply computer aided drafting tools to create 2D and 3D objects

CO2: sketch conics and different types of solids

CO3: Appreciate the need of Sectional views of solids and Development of surfaces of solids

CO4: Read and interpret engineering drawings

CO5: Conversion of orthographic projection into isometric view and vice versa manually and by using computer aided drafting
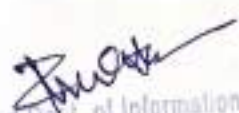
Subject Name: APPLIED PHYSICS LAB

Subject Code: D1BSAP2

CO1: Identify the V-I characteristics of Laser diode.

CO2: Evaluate the numerical and bending loss of given optical fiber.

CO3: Analyze the V-I characteristics of LED and photodiode devices.

CO4: Identify the type of semiconductor by using Hall Effect experiment.

CO5: Calculate the Plank's constant using Photocell.

Subject Name: PROBLEM SOLVING USING C PROGRAMMING LAB

Subject Code: D1ESCP5

CO1: Write solutions using problem solving techniques and appropriate programming constructs for solving problems

CO2: Develop programs using selection, iteration statements and arrays for a given scenario

CO3: Construct programs using functions & strings for a given application

CO4: Implement programs using pointers, structures & unions for various real time applications

CO5: Write programs using files & preprocessor directives and graphics functions for a given scenario

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Subject Name: BASIC ELECTRICAL & SIMULATION LAB   **Subject Code: D1ESBES**

CO1: Apply various laws to solve electrical networks.

CO2: Apply network theorems to solve complex electrical networks.

CO3: Evaluate the performance of different types of Electrical machines and single phase transformer by conducting various tests

CO4: Understand and analyze electrical installations using different lamp controlled methods, stair case wiring and different wiring connection

Subject Name: STATISTICAL METHODS AND VECTOR CALCULUS   **Subject Code: D2BSM5**

CO1: Apply Statistical logic for solving the problems.

CO2: Analyse the qualitative & quantitative data.

CO3: Analyse the time series for the given data

CO4: Explain and compute derivatives of vector valued functions, gradient functions

CO5: Evaluate the line- surface and volume integrals and converting them from one to another

Subject Name: ENGINEERING CHEMISTRY   **Subject Code: D2BSEC1**

CO1: Students will acquire the basic knowledge of conductance in Metals and Bond Structures.

CO2: The students are able to understand the basic properties of water and its usage in domestic and industrial purposes.

CO3: They will acquire the Knowledge of chemistry in Batteries.

CO4: They can learn the fundamentals and general properties of polymers and there engineering materials.

CO5: They can predict potential applications of chemistry and practical utility in order to become good engineers and entrepreneurs.

Subject Name: ENGLISH FOR SKILL ENHANCEMENT   **Subject Code: D2HSE1**

CO1: Understand the importance of vocabulary and sentence structures.

CO2: Choose appropriate vocabulary and sentence structures for their oral and written communication.

CO3: Demonstrate their understanding of the rules of functional grammar.

CO4: Develop comprehension skills from the known and unknown passages.

CO5: Take an active part in drafting paragraphs, letters, essays, abstracts, précis and reports in various contexts.

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CO6: Acquire basic proficiency in reading and writing modules of English.

Subject Name: ENGLISH FOR SKILL ENHANCEMENT   **Subject Code: D2HSE1**

CO1: Develop algorithmic solutions to simple computational problems Read, write, execute by hand simple Python programs.

CO2: Structure simple Python programs for solving problems.

CO3: Decompose a Python program into functions.

CO4: Represent compound data using Python lists, tuples, and dictionaries. CO5: Read and write data from/to files in Python Programs.

Subject Name: ELECTRONIC DEVCES & CIRCUITS   **Subject Code: D2ESED2**

CO1: Acquire the knowledge in semiconductor materials and knows the complete internal structure of PN junction its capacitances, resistances.

CO2: Design the circuits for the conversion of AC to DC Voltages.

CO3: Acquire knowledge in the structure of Transistor (different types, operation, characteristics and applications)

CO4: Analyze the dc bias circuitry of BJT.

CO5: Acquire knowledge in the structure of, FET, MOS (different types, operation, characteristics and applications)

Subject Name: ENGINEERING CHEMISTRY LAB   **Subject Code: D2BSEC2**

CO1: The concepts of error and its analysis and can also develop the skills to tabulate the experimental data and derive valid conclusions.

CO2: Hands on experience in performing the electro-analytical techniques such as conductometry, potentiometry and pH metry.

CO3: The ability to prepare polymers.

CO4: Estimation of Surface tension and viscosity of Lubricant oil.

Subject Name: ENGLISH LANGUAGE AND COMMUNICATION SKILLS LAB   **Subject Code: D2HSE2**

CO1: Understand the nuances of English language through audio- visual experience and group activities

CO2: Neutralise their accent for intelligibility

CO3: Speak with clarity and confidence which in turn enhances their employability skills

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Subject Name: PYTHON PROGRAMMING LAB　　　　　　　　**Subject Code: D2ESPP7**

CO1: Develop algorithmic solutions to simple computational problems Read, write, execute by hand simple Python programs.

CO2: Structure simple Python programs for solving problems.

CO3: Decompose a Python program into functions.

CO4: Represent compound data using Python lists, tuples, and dictionaries. CO5: Read and write data from/to files in Python Programs.

Subject Name: ELECTRONIC DEVCES & CIRCUITS LAB　　　　　**Subject Code: D2ESED2**

CO1: Design different electronic circuits for different applications using devices like Diodes, Transistors, etc.

CO2: Design circuits which can convert AC to DC.

CO3: Design various transistor biasing circuits.

CO4: Design of different Amplifier Circuits.

Subject Name: IT WORKSHOP　　　　　　　　　　　　　　**Subject Code: D2ESITW**

CO1: Apply knowledge for computer assembling, disassembling and software installation.

CO2: Ability to solve the trouble shooting problems.

CO3: Apply the tools for preparation of PPT, Documentation and budget sheet etc.

CO4: Create standard documents and research documents using Latex.

CO5: Able to create project plans

Subject Name: BUSINESS ECONOMICS AND FINANCIAL ANALYSIS　　**Subject Code: CHSM1**

CO1: Analyze the total structure of the business and able to identify and classify the different types of business entities.

CO2: Asses the demand and supply analyses with the help of various measures and types of Elasticity of demand.

CO3: Infer the knowledge about production and cost analysis for product and services.

CO4: Interpret the fundamental concepts related to financial accounting.

CO5: Predict the financial position by analyzing the financial statement of the company through various ratios.

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Subject Name: BUSINESS ECONOMICS AND FINANCIAL ANALYSIS   Subject Code: CBSM4

CO1: Apply mathematical logic to solve problems.

CO2: Analyse the assertions using predicate logic.

CO3: Analyse different properties of GCD.

CO4: Find the GCD using Division and Euclidean Algorithm.

CO5: Illustrate the basic terminology of functions, relations, sets and demonstrate knowledge of their associated operations.

CO6: Understand the importance of algebraic properties with regard to working within various number systems.

Subject Name: DATA STRUCTURES   Subject Code: CESDS1

CO1: Understand the concept of ADT.

CO2: Ability to choose appropriate data structures to represent data items in real world problems.

CO3: Ability to analyses the time and space complexities of algorithms.

CO4: Ability to design programs using a variety of data structures such as stacks, queues, hash tables, binary trees, search trees, heaps, graphs, and B-trees.

CO5: Able to analyze and implement various kinds of searching and sorting techniques.

Subject Name: DIGITAL LOGIC DESIGN   Subject Code: C63PC1

CO1: Convert numeric information in different forms, e.g. different bases, signed integers, various codes such as ASCII, Gray, and BCD.

CO2: Realize simple Boolean expressions using the theorems and postulates of Boolean algebra and to minimize combinational functions.

CO3: Design and analyze of small combinational circuits and to use standard combinational functions/building blocks to build larger more complex circuits.

CO4: Design of sequential logic circuits and synthesizing of threshold functions.

CO5: Design and analyze small sequential circuits and devices and to use standard sequential functions/building blocks to build larger more complex circuits

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Subject Name: OPERATING SYSTEMS   **Subject Code: C63PC2**

CO1: Able to understand the basic overview of operating systems and system calls

CO2: Ability to solve synchronization problem with Two-Process solution, Petersons solutions and apply the concepts of minimization of turnaround time, waiting time and response time to find CPU scheduling Problems 3.

CO3: Apply the page replacement algorithms to identify the page fault in the given string.

CO4: Able to distinguish between file access methods and allocation methods

CO5: Ability to apply Bankers Algorithm to avoid deadlocks and change access controls to protect files

Subject Name: LINUX PROGRAMMING   **Subject Code: C63PC3**

CO1: Work confidently in Linux environment.

CO2: Work with shell script to automate different tasks as Linux administration

Subject Name: DATA STRUCTURES LAB   **Subject Code: CESDS2**

CO1: Able to identify the appropriate data structures and algorithms for solving real world problems.

CO2: Able to implement various kinds of searching and sorting techniques.

CO3: Able to implement data structures such as stacks, queues, Search trees, and hash tables to solve various computing problems.

Subject Name: LINUX/OPERATING SYSTEMS LAB   **Subject Code: C63PC4**

CO1: Ability to understand the Linux environment

CO2: Ability to perform the file management and multiple tasks using shell scripts in Linux Environment.

CO3: Able to implement various Scheduling algorithms.

CO4: Able to detect and solve deadlocks

Subject Name: PROBABILITY & STATISTICS   **Subject Code: CBSM3**

CO1: Random variables and various discrete and continuous probability distributions and their properties.
CO2: Calculate interval estimations of Mean and Proportion of large samples.

CO3: Make important decisions s for few samples which are taken from a large data.

CO4: Calculate Mean and Proportion and to make important decisions from large samples which are taken from normal populations.

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CO5: Test the hypothesis and give the inference to the given data.

CO6: The statistical methods of studying data sample.

Subject Name: COMPUTER ORGANIZATION   Subject Code: C64PC1

CO1: Able to understand the basic components and the design of CPU, ALU and Control Unit.

CO2: Ability to understand the data transfer between I/O devices.

CO3: Ability to understand Memory hierarchy and its impact on computer cost/performance.

CO4: Ability to use instruction sets and formats of 8086.

CO5: Able to write assembly language programs to solve problems.

Subject Name: DATABASE MANAGEMENT SYSTEMS   Subject Code: C64PC2

CO1: Demonstrate the basic elements of a relational database management system.

CO2: Ability to identify the data models for relevant problems.

CO3: Ability to design entity relationship model and convert entity relationship diagrams into RDBMS and formulate SQL queries on the data.

CO4: Apply normalization for the development of application software.

CO5: Understand transaction processing, concurrency control and recovery techniques.

Subject Name: JAVA PROGRAMMING   Subject Code: C64PC3

CO1: Able to understand the use of inheritance and abstract classes.

CO2: Able to gain knowledge on how to use packages, interfaces, I/O stream classes.

CO3: Able to handle exceptions by using exceptional handling mechanisms.

CO4: Able to develop multithreaded applications with synchronization.

CO5: Able to solve problems using java collection framework.

CO6: Able to develop applets for web applications and design GUI based applications

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Subject Name: SOFTWARE ENGINEERING   Subject Code: C65PC1

CO1: An ability to identify and apply suitable process patterns and process models accordingly.

CO2: Able to identify requirements, apply requirements engineering process and design system models.

CO3: Designing Architecture to acquire knowledge of building an application and use of UML diagrams.

CO4: Able to test software by applying various testing strategies and product metrics to measure the product.

CO5: Assessing risk factors by formulating risk management and to assess the quality of software

Subject Name: PYTHON PROGRAMMING   Subject Code: C65PC2

CO1: Understand and comprehend the basics of python programming.

CO2: Express different conditional and decision making statements used to develop python applications.

CO3: Learn and implement various data structures provided by python library including string, list, dictionary and its operations etc

CO4: Define and demonstrate the use of the built-in functions and better usage of string methods in the development of python programming.

CO5: Develop real-world applications by using various object oriented programming concepts

Subject Name: COMPILER DESIGN   Subject Code: C65PC3

CO1: Ability to design, develops, and implements a compiler for any language.

CO2: Able to use lex and yacc tools for developing a scanner and a parser.

CO3: Able to design and implement LL and LR parsers.

CO4: Able to design algorithms to perform code optimization in order to improve the performance of a program in terms of space and time complexity.

CO5: Ability to design algorithms to generate machine code

Subject Name: COMPUTER NETWORKS   Subject Code: C65PC4

CO1: Able to understand and explore the basics of data communication.

CO2: Able to understand data link layer with transmission error to provide a well defined interface to the network layer.

CO3: Classify the routing protocols and analyzes how to assign the IP addresses for a given network.

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Subject Name: DESIGN AND ANALYSIS OF ALGORITHMS   **Subject Code: C64PC4**

CO1: Able to analyze the performance of the algorithm in terms of time and space & apply the concept of divide & conquer method on various examples.

CO2: Able to find out the solution for the given example problems by using Backtracking & apply the concept of graph problems on various examples.

CO3: Able to solve the problems with Greedy method for the given example problems.

CO4: Able to solve optimization problems using Dynamic Programming.

CO5: Able to solve the given example problems using Branch & Bound and design the deterministic & non deterministic algorithms and categorize them as a Np-hard and Np-complete problems accordingly.

Subject Name: FORMAL LANGUAGES AND AUTOMATA THEORY   **Subject Code: C64PC5**

CO1: Demonstrate the abstract models of computing includes Finite Automata.

CO2: Construct FA for regular expressions and vice versa and minimization &equivalence of FA.

CO3: Design CFG for the given Formal language.

CO4: Design PDA for CFG and prove the equivalence of CFG and PDA.

CO5: Design Normal forms for CFG and design a TM for a given language.

CO6: Distinguish between Decidable and Undecidable problems.

Subject Name: JAVA PROGRAMMING LAB   **Subject Code: C64PC6**

CO1: Able to write programs for solving real world problems using java collection frame work.

CO2: Able to write programs using abstract classes.

CO3: Design and develop programs using objects and inheritance in Java language.

CO4: Able to write multithreaded programs.

CO5: Able to write GUI programs using swing controls in Java.

Subject Name: DATABASE MANAGEMENT SYSTEMS LAB   **Subject Code: C64PC7**

CO1: Formulate queries using SQL DML/DDL/DCL commands.

CO2: Analyze the normalization techniques

CO3: Design and implement a database schema for given problem.

CO4: Develop programs using PL/SQL

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CO4: Able to understand to perform end to end services in the transport layer.

CO5: Ability to access the global information about services on the Internet.

Subject Name: OBJECT ORIENTED ANALYSIS AND DESIGN　　　　Subject Code: C65PC5

CO1: Graduate can able to take up the case studies and model it in different views with respect user requirement such as use case, logical, component and deployment and etc, and preparation of document of the project for the unified Library application

Subject Name: OBJECT ORIENTED ANALYSIS AND DESIGN LAB　　　　Subject Code: C65PC7

CO1: Perform Object Oriented analysis and design for a given problem specification.

CO2: Identify and map basic software requirements in UML mapping.

CO3: Improve the software quality using design patterns and to explain the rationale behind applying specific design

Subject Name: PYTHON PROGRAMMING LAB　　　　Subject Code: C65PC8

CO1: Implement the fundamental programming elements: operators, statements, conditional and control flow statements.

CO2: Use predefined functions and build functions.

CO3: Use python modules and implement data structure to solve various computing problems

Subject Name: WEB TECHNOLOGIES　　　　Subject Code: C66PC1

CO1: Able to design a static web page using forms and frames in HTML.

CO2: Able to validate client side scripting using onClick (), onSubmit(), onChange() events in JavaScript.

CO3: Able to design a dynamic web page using PHP.

CO4: Able to construct a validation page which connects to a data base given and able to perform the DML functionalities by using mysqli_connect() ,mysqli_query(), mysqli_fetch_array(), mysqli_close( ) in PHP.

CO5: Analyze how to develop a well formed and valid xml document by using DTDs and Schemas which allows the validation of text elements.

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CO6: Able to write server side program by using servlets for given problem and able to develop a connection between both the ends by doGet() and doPost() methods.& Develop JSP applications implementing Session Management and Database Connectivity

Subject Name: STACK TECHNOLOGIES   Subject Code: C66PE3C

CO1: Enumerate the Basic concepts of web & Markup Languages.

CO2: Develop web Applications using scripting Languages & Frameworks

CO3: Make use of Express JS and and Node JS Frameworks

CO4: Illustrate the uses of web services concepts like react js

Subject Name: DISTRIBUTED DATABASES   Subject Code: C66PE4A

CO1: Understand theoretical and practical aspects of distributed database systems.

CO2: Study and identify various issues related to the development of distributed database system.

CO3: Understand the design aspects of object-oriented database system and related development.

Subject Name: INTERNET OF THINGS   Subject Code: B67PE1

CO1: Able to understand IOT and API's and various technologies using IOT.

CO2: Able to identify network function virtualization.

CO3: Able to use various features of Python.

CO4: Able to work on the IOT devices.

CO5: Able to develop IOT web application using Python.

Subject Name: ARTIFICIAL INTELLIGENCE   Subject Code: B67PE1

CO1: Possess the ability to formulate an efficient problem space for a problem expressed in English.

CO2: Possess the ability to select a search algorithm for a problem and characterize its time and space complexities.

CO3: Possess the skill for representing knowledge using the appropriate technique

CO4: Possess the ability to apply AI techniques to solve problems of Game Playing, Expert Systems, Machine Learning and Natural Language Processing

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CO4: Able to understand to perform end to end services in the transport layer.

CO5: Ability to access the global information about services on the Internet.

Subject Name: OBJECT ORIENTED ANALYSIS AND DESIGN   Subject Code: C65PC5

CO1: Graduate can able to take up the case studies and model it in different views with respect user requirement such as use case, logical, component and deployment and etc, and preparation of document of the project for the unified Library application

Subject Name: OBJECT ORIENTED ANALYSIS AND DESIGN LAB   Subject Code: C65PC7

CO1: Perform Object Oriented analysis and design for a given problem specification.

CO2: Identify and map basic software requirements in UML mapping.

CO3: Improve the software quality using design patterns and to explain the rationale behind applying specific design

Subject Name: PYTHON PROGRAMMING LAB   Subject Code: C65PC8

CO1: Implement the fundamental programming elements: operators, statements, conditional and control flow statements.

CO2: Use predefined functions and build functions.

CO3: Use python modules and implement data structure to solve various computing problems

Subject Name: WEB TECHNOLOGIES   Subject Code: C66PC1

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CO5: Analyze how to develop a well formed and valid xml document by using DTDs and Schemas which allows the validation of text elements.

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Subject Name: MOBILE COMPUTING **Subject Code: B67PE2**

CO1: Able to think and develop new mobile application.

CO2: Able to take any new technical issue related to this new paradigm and come up with a solution(s).

CO3: Able to develop new ad hoc network applications and/or algorithms/protocols.

CO4: Able to understand & develop any existing or new protocol related to mobile environment

Subject Name: INFORMATION SECURITY **Subject Code: B67PE3**

CO1: Understand the difference between threats and attacks.

CO2: Know the KEY Elements and Logical Elements of Networks

CO3: Able to handle authentication algorithms.

CO4: Understand the Policies, Guideline and Framework of E-mail and IP Security.

CO5: Understand the Policies, Guideline and Framework of Web Security

Subject Name: ADVANCED COMMUNICATION SKILLS LAB **Subject Code: BE23**

CO1: Acquire vocabulary and use it contextually

CO2: Listen and speak effectively

CO3: Develop proficiency in academic reading and writing

CO4: Increase possibilities of job prospects

CO5: Communicate confidently in formal and informal contexts

CO6: Develop interpersonal communication skills

Subject Name: WIRELESS SENSOR NETWORKS **Subject Code: B67PE6**

CO1: Able to implement and deploy wireless sensor networks.

CO2: To discuss the challenges in designing MAC, routing and transport protocols for wireless sensor networks.

CO3: To discuss the challenges in designing routing and transport protocols for wireless sensor networks.

CO4: Able to design ranging techniques.

CO5: To explain various security threats to networks and describe proposed solutions

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Subject Name: SEMANTIC WEB AND SOCIAL NETWORKS   Subject Code: B68PE2

CO1: Able to design Web intelligence.

CO2: Able to design ontologies and resource description frameworks.

CO3: Able to construct ontology methods.

CO4: Ability to design web applications

CO5: Gain knowledge on social networks.

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